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The Infant and Young Child

ITS CARE AND FEEDING FROM
BIRTH UNTIL SCHOOL AGE
A MANUAL FOR MOTHERS

By 

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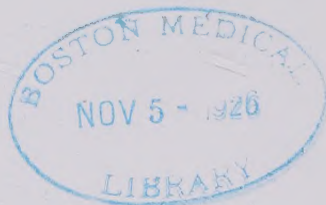
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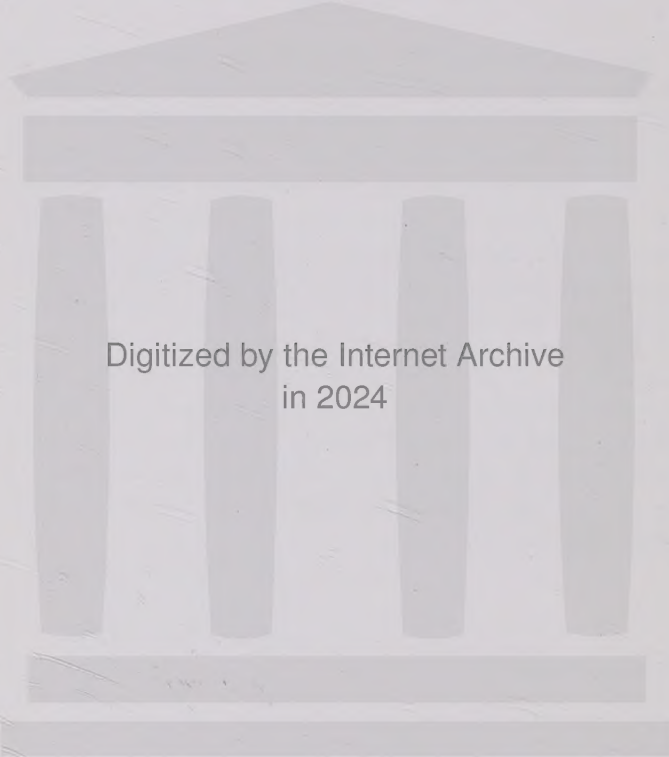
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PREFACE

IN this little book the writers have endeavored to tell mothers what they should know in order to intelligently feed and care for their children from the time they are born until they are six years old. They have attempted to anticipate and answer the questions which mothers are in the habit of asking about the care of their children and the details of their daily life. They have said something about the diseases of infancy and early childhood, but only enough to aid the mother in determining whether her child is ill or not and to enable her to do something for her child until the doctor arrives. It is not intended in any way to take the place of a physician, when a child is ill, but simply to enable mothers to take better care of their children when they are well, and to carry out the physician's orders more understandingly when they are ill.

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THE INFANT AND YOUNG CHILD

SECTION I

PREPARATION FOR THE BABY, THE BATH, AND CLOTHING

Chapter I

ARTICLES TO BE PROVIDED BEFORE THE BABY COMES

THE obstetrician will tell the mother what to get for herself or, as many obstetricians do, will give her a printed list. This will naturally vary a good deal, according to whether the confinement is to be at home or in the hospital. The baby will need about the same outfit in either case. It is well for the mother to begin to get together the things for the baby as soon as possible after she knows she is pregnant, rather than to put it off until the last few weeks.

The layette naturally varies with circumstances; the following list represents the essentials:

Crib or sleeping basket.

Bureau for clothes.

Portable clothes rack.

Folding rubber bath-tub.

Scales.

Two white enamel pails with covers, for diapers.

Small white enamel bowl.

Tray for bath articles.

Covered jar for boric solution.
Covered jar for olive oil.
Covered jar for absorbent cotton.
Fine-tooth comb.
Soft hair-brush.
Room thermometer.
Bath thermometer.
Safety-pins (three sizes).
Hot-water bottle.
3 or 4 soft wash cloths.
Package of sterilized gauze (for dressing the cord).
2 pounds of absorbent cotton.
 $\frac{1}{2}$ pound of boric acid crystals.
6 ounces of olive oil.
Castile soap.
1 box of talcum powder.
2 yards of rubber "stork sheeting."

CLOTHES

A soft, old piece of blanket to receive the baby in
when born.
2 light flannel blankets, 1 yard square.
2 flannel binders.
2 bands.
3 shirts.
3 gertrudes.
3 dresses.
3 nightgowns.
2 dozen small diapers.
3 dozen larger diapers.
2 sweaters or sacks.

THE BATH

As soon as the cord is off and the navel dried, usually about ten days after birth, tub-baths may be given. Before this sponge-baths are used.

The daily bath is given about 8.30 A. M., after which the baby has its 9 o'clock feeding. In good weather, in the spring, summer or autumn, a normal baby may be put out of doors in its carriage or crib following the 9 o'clock feeding. In the winter, or when babies are very small and weak, it is better to keep them in the house after the bath. The baby should have a sponge-bath at night when his day clothes are changed. There are a number of different kinds of tubs which may be used. The three most convenient are the following: (1) the small tin foot-tub; (2) the standing rubber tub; (3) the rubber tub which fits on stretchers across the regular bath-tub. It is not important which one of these tubs is used; some prefer one, some another. Our own personal preference is for the rubber tub which fits across the regular bath-tub. If the tub is built attached to the wall, this cannot be used.

Temperature of Water.—The temperature of the water should be about 98° F. at six months, and 85° F. when the baby is a year old. It should always be tested with a bath thermometer, as a temperature which might seem right to the nurse's hand or elbow, might be altogether too hot or too cold for the baby. The room in which the baby is bathed should have a temperature of at least 80° F. If the room in which the baby is bathed has an open

fire-place, the bath should be given in front of the fire. If the bath is given in the bathroom, as it usually is, the room may be raised to the desired temperature by the use of the portable electric heater or a gas or oil stove, if necessary.

Technic of the Bath.—The nurse should wear a soft flannel apron, over which is a bath towel. The baby is undressed, wrapped in the bath towel, and the nose, eyes, and scalp (see below) attended to before it is put into the tub. Then the body is soaped with warm water and soap from a small dish while the baby is still in the nurse's lap. Cheese-cloth, absorbent cotton, or a very soft face cloth may be used as a sponge. After the baby has been soaped it is put into the tub and the soap is gently washed off. During the bath babies who are too young to sit up are supported by the nurse's left hand underneath the back; older babies are allowed to sit up.

Soap.—The best soap to use is a pure Castile or Ivory, or, when the skin is tender, a superfatted lanolin soap. In drying the body an old diaper makes a very soft and suitable towel. When the baby comes out of the bath it is taken on the nurse's lap in the bath towel and dried. The bath towel is then removed and the baby is wrapped in the flannel apron while the rest of the toilet is attended to. It is well to be sure that any places where two skin surfaces come together, such as the groins, armpits, and creases of the neck in fat babies, are dried with unusual care, because, if moisture is left there, the skin may become so macerated as to cause considerable irritation. Drying of the baby is of very great importance, and a baby who is thoroughly dried probably needs no powder. The usual custom, however, is to powder after the bath. Care must be taken not to use too much powder, as this may do more harm than good by irritating the skin.



FIG. 1.—FOLDING RUBBER BATH-TUB.
(Courtesy of Jordan Marsh Co.)

CARE OF THE EYES

The eyes of a baby, up to two months of age, should be washed each day with a saturated solution of boric acid, using a different piece of cotton for each eye. Slightly inflamed eyes are very common in small babies, and are not ordinarily of serious moment, but may take some time to clear up. If there is a yellowish discharge from the eyes, call the doctor.

Directions for Making Boric Acid Solution.—Put a tablespoonful of boric acid crystals into a clean 8-ounce bottle (do not use one of the baby's nursing bottles), fill it three-quarters full of hot water, and shake vigorously for a few minutes. Allow the undissolved crystals to settle to the bottom and pour off the clear fluid into a glass, which should be kept covered. It is best to make a fresh solution every few days.

CARE OF THE MOUTH

It is not necessary to wash a baby's mouth. In fact, it is far better to leave it alone, because it is almost impossible to wash it without causing some irritation, which predisposes to inflammation. The best way to cleanse it is to give the baby a little water in a bottle or a spoon. As soon as a tooth appears, brushing of the teeth should be begun (see section on Teeth).

CARE OF THE SCALP

The scalp should be washed with soap and water every day. If this is done carefully it will probably be kept in good condition. Certain babies have, however, a scaly condition of the scalp, the common term for which is "cradle cap." The following is the best treatment for

this condition: at night, before the baby goes to bed, the scalp is well rubbed with olive oil or boric acid ointment, and an old cap put on to prevent the oil or ointment from rubbing off on the pillow-case. The scalp is shampooed as usual during the bath in the morning. The scale is so much softened by the applications at night that it is easily washed off, and, after a few treatments, the scalp is usually clean. The use of this treatment three times a week will keep moderately scaly scalps in good condition. If there is a great deal of scale, a fine comb may be used in the morning to loosen the scale. This should be done with great care, however, and if the scales are hard or crusty and come off with difficulty, the doctor should be called.

CARE OF THE GENITALIA

In girls the genitalia should be washed during the bath with absorbent cotton and water. Do not use soap on the tender inner parts. Be sure to dry very carefully. Almost every baby boy has a tight foreskin, which is drawn back with difficulty. This is nothing abnormal, but it is best to pull it back every other day, wash away the accumulated secretions, and smear with boric acid ointment. If it is very tight, call the doctor, who can probably break up the adhesions. If this is not possible, it may be wise to circumcise the baby.

CARE OF THE NOSE AND EARS

The nose is cleaned with twisted pledgets of cotton or with a match or toothpick wrapped with cotton. The ears are left alone except for the external portions, which are washed in the regular way. There is always a certain amount of wax in the internal part of the ear which should not be meddled with.

CARE OF THE NAVEL

The navel may be a little moist during the first few weeks of life. If this is the case, a drying powder, such as aristol or bismuth subgallate, should be applied daily with a toothpick wrapped with cotton. Never apply a strap to a protruding navel when there is any discharge, even the slightest. A discharging navel which is strapped may cause much trouble.

CARE OF THE SKIN

The skin of a baby is delicate and often becomes irritated from slight causes. If the skin is not irritated, do nothing to it, except to keep it clean and dry. If there is a tendency to excessive dryness or scaliness, an olive oil or lanolin rub after the bath is advisable. Most of the slight rashes that babies have are not of serious moment, and are often caused by too warm clothing. The buttocks sometimes get red and irritated, especially if the stools have a tendency to looseness. The use of too alkaline a soap in washing the diapers or improper rinsing of the diapers (see section on Diapers) may also occasionally cause considerable irritation of the skin. If the buttocks are not irritated, the only care necessary after changing the diapers is to wash them each time with warm water and absorbent cotton. Be sure to dry them carefully. There are a number of different preparations which may be used in treating irritated buttocks. If the irritation is slight, a mixture of equal parts of olive oil and lime-water (shaken vigorously in a small bottle just before using) is efficient. Another good preparation is a mixture of equal parts of zinc oxid ointment and castor oil. In some cases the application of stearate of zinc powder after washing with a mixture of

equal parts of lime-water and water works better than an ointment or oil. In still other cases, especially when there is a considerable inflammation with many small red spots, a pad of gauze wet with a saturated solution of boric acid kept applied to the buttocks underneath the diaper is valuable. It is of benefit in any severely irritated condition of the buttocks to expose them to the air as much as possible. The baby should be put, therefore, in a warm room, with the dress pulled up and the diapers removed, and as much of the irritated region as possible exposed to the air for several hours.

THE NAILS

The finger-nails and toe-nails should be kept cut short and cleaned with an orangewood stick. This is a part of the baby's toilet which is frequently neglected. Long, dirty finger-nails are not only objectionable to look at, but may be actually a source of danger if the baby scratches itself.

BATHING OF OLDER CHILDREN

After the baby is two years old the time of the bath may be adapted to the convenience of the family routine. If there are two bath-rooms in the house it can be given in the early morning as before. If there is only one bath-room it is usually more convenient to give it later in the morning just before the nap or between 5 and 6 o'clock in the afternoon before supper. The child then has its supper in its wrapper and slippers and goes to bed. Most people prefer this time to the late morning. The temperature of the bath for children over two years old should be varied according to the season. In the winter it should be about 85° F., in the summer about 80° F.

Cold Sponges.—For children over two years old, especially those who are susceptible to colds, cold douches are beneficial. The child is given its warm bath as usual, is then stood up in the tub, and two or three spongefuls of cold water squeezed over the chest and back. Most children grow to like this after a time and it apparently does diminish somewhat the tendency to colds in the winter. A whole cold bath, such as might be taken by an adult, should not be given to a child.

Bathing During Colds.—A common question that mothers ask is, "May I bathe the baby if it has a cold?" It is better not to put the baby into the tub during the acute stage, but a sponge-bath should be given.

Chapter III

CLOTHING

CLOTHING DURING THE FIRST YEAR

THE young baby wears the following articles of clothing; the numbers of each article given represent the minimum need in the outfit:

1. Two flannel binders.
2. Three silk and wool bands.
3. Three shirts.
4. Three flannel or silk and wool petticoats or "gertrudes."
5. Three long dresses.
6. Six nightgowns.
7. Five dozen diapers.
8. Two flannel sacks or sweaters.

The **binder** is a strip of flannel or of knit material, about 18 inches long by 6 inches wide. It is wound snugly about the baby's abdomen, and is fastened in front with small safety-pins or tapes. Its purpose is to keep the dressing of the cord on and to protect the bowels from changes of temperature. It does not prevent or cure hernia, and is not necessary after the cord is off and the dressings have been discontinued. It should be left off after the first month, and the band substituted.

The **band** is a light sleeveless shirt which is pinned to the diapers at the bottom. It should be made of silk and wool to obtain warmth without weight, and to avoid the irritation of the skin that might be caused

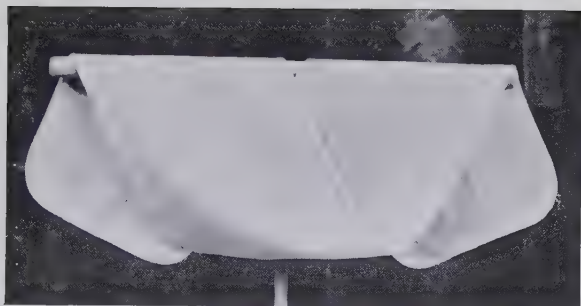


FIG. 2.—KNITTED BINDER.
(Courtesy of Jordan Marsh Co.)

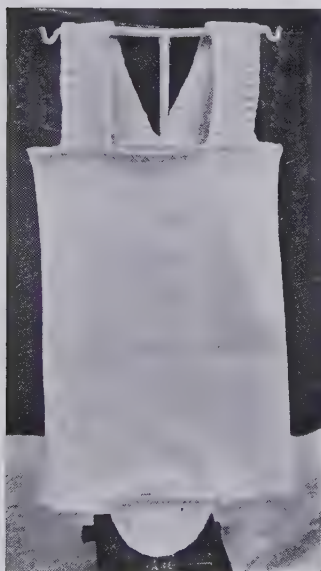


FIG. 3.—KNITTED BAND.
(Courtesy of Jordan Marsh Co.)



FIG. 4.—SHIRT.
(Courtesy of Jordan Marsh Co.)



FIG. 5.—FLANNEL GERTRUDE.
(Courtesy of Jordan Marsh Co.)



FIG. 6.—KNITTED NIGHTGOWN.
(Courtesy of Jordan Marsh Co.)

by wool alone. It should be continued as long as it is possible to buy bands large enough for the child.

The **shirt** goes on over the binder or band, and is also best made of silk and wool, although light-weight wool will do. In the summer it may be made of silk or of cotton. Some shirts are made to button down the front; others are made with little tapes which tie in front. Our preference is for those which button.

The **Petticoat** or "**Gertrude**."—The petticoat is made of cotton and wool, silk and wool, or all wool flannel. Silk and wool is the most satisfactory material, as it does not shrink so much or have the tendency to get thick and harsh that the others do, unless improperly washed. The petticoat for young babies is a long garment, nearly a yard long, and is perhaps the most important of all the garments for warmth. In the summer it may be made of light cotton instead of wool.

The **Dress**.—Dresses are best made of nainsook or batiste, and for young babies are long like the petticoat. There should be no rough embroidery about the neck, where it might irritate the baby's skin.

The **nightgown** is made of knit cotton material and should have a puckering string at the bottom so that the baby cannot kick its feet out. At night a baby is dressed as follows: binder or band, diapers, and nightgown.

Sacks and Sweaters.—Two or three flannel sacks or sweaters are useful additions to the wardrobe and are usually worn when the baby is taken out of bed.

Flannel Blankets.—A flannel blanket about a yard square is convenient for wrapping the baby in. It must be remembered, however, that if the day is warm, care should be taken not to have it wrapped up too warmly. A baby should always be dressed according to the tem-

perature and not according to the season, especially in the changeable climate of our North Atlantic states. As a general thing babies are dressed altogether too warmly.

Bonnets are made of various materials, according to the season. The bonnet is usually changed for a hat when the baby is a year old in the summer. In the winter they are usually worn until the baby is about three years old.

Diapers come in two sizes: 18 by 36 inches and 22 by 44 inches. There are several kinds of diaper material, the best one being "bird's-eye" cotton. Three dozen of the large diapers and two dozen of the small will be needed for the new baby. It is well to use two diapers, a small one inside, covered by a large one. The rubber diaper covers which are so commonly used are obnoxious, as they allow no circulation of air and may make the baby uncomfortable, as well as being harmful to its skin. They may be used, however, for a short time on special occasions when it is necessary to keep the clothes dry. The diaper should be changed immediately if it is wet or dirty. The buttocks should be washed with warm water and absorbent cotton and carefully dried at each change of the diaper. Diapers should always be changed, even if only slightly wet, and a diaper should always be put into the wash, even if it is only wet and not soiled. Scrupulous care of the buttocks and diapers is absolutely necessary if irritation of the skin is to be avoided.

Washing of the Diapers.—Two white enamel pails with covers should be provided for the diapers. As soon as a diaper is soiled, all the solid fecal material should be scraped off with an old knife kept for the purpose and put down the hopper. Then the diaper is put into one of the pails. At the end of the day the pail is filled with

warm water and the diapers are allowed to soak over night. Great care must be taken in the washing, and soap with little free alkali, such as Ivory soap, should be used. It is especially important to rinse diapers in four or five changes of water, as it is essential to get rid of all irritating material from the soap or from the baby's discharges. If the buttocks are sore and if there seems to be considerable difficulty in correcting the condition, it is best to boil the diapers each day after they have been washed and rinsed. The average baby will use at least eighteen diapers in the course of twenty-four hours. The time at which diapers can be omitted and drawers substituted varies according to how well the baby is trained. Most babies should leave off diapers at about eighteen months.

SHORT CLOTHES

When the baby is about six months old short dresses are substituted for long. The age at which the change is made varies with the vigor and activity of the individual baby, the season of the year, and the wishes of the mother. As a matter of fact, there is no reason why a baby should not wear short clothes from birth. When the dresses are shortened the petticoats and "gertrudes" must, of course, also be shortened and the baby's legs must be covered. It should wear long stockings or socks, which must be pinned to the diapers, so that it cannot kick them off. There is no change made in the clothes worn at night.

WARDROBE FROM ONE YEAR ON

As soon as the baby begins to creep, at one year or often earlier, for every-day use rompers may be substituted for dresses. A good material is cotton crepe.

Shoes.—As soon as the baby begins to walk it should have some sort of shoes. Shoes at this age should not be stiff and unyielding, as it is desirable to allow the foot to spread and to keep it in its natural shape. Moccasins or ankle ties are very satisfactory until the baby begins to walk about out of doors. If it is cold weather high laced shoes with stiff soles should be worn. Most of the shoes for children which are sold in the shoe and department stores are very satisfactory. It is important to have them rights and lefts and not to get the shapeless interchangeable shoes which were formerly so generally used.

Bands.—The band should be continued as long as it is possible to buy them large enough (ten years), the reason for this being that it is important to protect the bowels from sudden changes in temperature or chilling, even in older children.

Petticoats.—The flannel petticoat is continued indefinitely for girls during the winter, but may be left off in the summer and cotton ones substituted. A boy usually discards rompers for trousers and the petticoat for a waist and drawers when about two years old.

Waists.—The fit and cut of the waist is important, as the garters and drawers are fastened to it, and there is considerable downward pull which may have a tendency to make the child round shouldered if it does not come in the right place. The pull should be direct from the shoulder, close in where it joins the neck, and not from the outer part of the shoulder. There are three things to look for in a waist, in order to be sure that it will fit snugly about the neck and not have a tendency to slip to the outer part of the shoulder:

1. It must not be too large; if anything it should be a shade too small.

2. The neck should not be cut away much.
3. The bands which go over the shoulders should be broad.

If these three conditions are fulfilled the "pull" of the waist will be correct.

Union suits are convenient, as they cover the bowels well and there are no vacant spaces left unprotected, as may be the case with a separate shirt and drawers. The disadvantage of union suits is that, if a portion of the suit becomes dirty or wet, the whole thing has to be put into the wash.

Stockings and Garters.—In the summer short socks may be worn, and it is now the fashion for many children to wear them in the winter also. In our opinion this is a bad practice for any child; long stockings should always be worn in the winter. If long stockings are worn, a suspension garter is used which is attached to the waist; if short stockings are worn, they are kept up by elastic bands around the legs below the knee. Needless to say, it is very important to be sure that round elastic garters are not tight enough to interfere with the circulation. They are more likely to do so if they are narrow.

Simplicity in Dress.—It is always in better taste to have all the clothing of children as simple as possible. Moreover, the simpler the clothing, the more comfortable are the children. No infant or small boy ever cares how it looks; neither do small girls, unless they have been foolishly brought up. Fine clothes are for the pleasure of the mother. They are a nuisance to the child.

CLOTHING FOR OUT OF DOORS

If the ground is at all damp or cold rubbers should be worn; in the winter, overshoes. Many children have

a tendency to cold feet. Heavy knit woolen stockings, heavy shoes and overshoes, are none too warm for such children in the winter. Sometimes, however, cold feet are due to excessive perspiration. In such cases thin stockings are better. The soles of children's shoes are usually so thin that it is especially important for them to be protected by either rubbers or overshoes if the ground is cold or damp. Children under six years of age should wear in the winter heavy tights of knit or wadded material which come up well above the waist. Mittens are preferable to gloves for small children. They keep the hands much warmer and are easier to keep on.

Clothing and Climate.—This section is written with the climate of the North Atlantic Seaboard in mind, and it is necessary to use common sense and to adapt the clothes to the climate. In any climate where there are constant changes of temperature, as in New England, it will be necessary to vary the warmth of the clothing from day to day. In general, it may be said that most babies and children are dressed too warmly. In the spring, for the older children, as the days begin to get warmer, the woolen underclothes should be discarded and cotton or silk ones substituted. Silk and wool next the skin is always better for children under four years of age. In winter the weight of the clothes should vary with the temperature of the house in which the child lives. If it lives in a hot apartment house, it should wear light underclothes and put on heavy outer clothes when it goes out; if it lives in a drafty, underheated house, it should have warmer underclothes indoors and lighter outer clothes for outdoors.

SECTION II

FEEDING

Chapter IV

BREAST FEEDING

THE natural food for a baby is its own mother's milk. No mother is doing her duty by her baby unless she nurses it, provided she is able. She should not consider in any way her own convenience or pleasure in comparison with the interest of her baby. She brought the baby into the world and it is her business to do the best she can for it. The only reasonable excuse for a mother not nursing her baby is the necessity of going out to earn a living for herself and her baby. No woman would think of not nursing her baby if she realized how much more likely it is to live and how much less likely to be sick when it is breast fed. It has been found that in Boston a breast-fed baby has six times the chance of surviving the first year as a bottle-fed baby. About 90 per cent. of all infantile deaths are in bottle fed and less than 10 per cent. of the fatal cases of the diarrheal diseases occur in the breast fed. Furthermore, breast-fed babies as a class are more healthy, more vigorous, and more resistant to disease than are bottle-fed babies. It seems to us, moreover, that they also make better and stronger children and adults. Breast feeding gives them a start which they can get in no other way.

Nursing Given Up on Insufficient Grounds.—Almost all women are able to nurse their babies either wholly or in part. In general, mothers, and unfortunately their nurses and physicians as well, are altogether too prone to believe on insufficient grounds that they are unable to nurse their babies. They often give up nursing because there is no milk, when, if they waited a little longer, the milk would appear. They forget that a supply, small at first, may become sufficient when the mother is up and about and leading her normal life. Many women are not willing to bear the discomfort of cracked nipples for a time. Sometimes they are told that it is wrong to feed a baby partly on breast milk and partly on an artificial food, and that the combination will make it ill. This statement is, of course, erroneous, as breast milk, instead of interfering with the digestion of an artificial food, makes the baby better able to take care of it. Mothers fail to appreciate that breast milk is even more important for the baby in the first few weeks of life than later, and consequently give up because they think that they cannot continue to nurse very long. Sometimes they do not try to nurse because they have not been able to nurse other babies. This fact does not, however, prove at all that they may not be able to nurse the present one. It is often said that women are too nervous or too delicate to nurse their babies, and that their milk will therefore be bad on this account. Many mothers that seem too nervous, however, often have good milk, and mothers that have previously been delicate are often better when nursing than ever before. Women who consider themselves nervous or delicate should, therefore, always at least make the attempt to nurse their infants. There is, moreover, no relation between the size of a woman or of her breasts and her ability

to nurse. Many small women with small breasts have more and better milk than large women with large breasts.

Contraindications to Nursing.—Women with active tuberculosis of the lungs should not nurse their babies; neither should women with inactive tuberculosis of the lungs, unless they have been cured for a long time and are very well. Women that are insane or have epilepsy ought not to nurse. It is usually unwise for women who have had severe hemorrhages at the time of the birth of the child to nurse. It is also wiser for women who have an acute septic infection after childbirth or disease of the kidneys not to nurse. It is usually inadvisable for really delicate and feeble women to nurse their babies, because, as a rule, their milk is poor and the strain of nursing is too much for them. It is likewise inadvisable for women who have some chronic disease to nurse their babies, because it almost always does them harm. In each case, however, the need of the individual baby and the condition of the individual mother must be balanced and nursing decided on or not, according to the greater need. Syphilis is not a contraindication to a mother nursing her own baby, because her baby has also always been infected with the disease. She must not, however, nurse any other baby.

Inability of Infants to Nurse.—Deformities of the lips and mouth sometimes prevent a baby from nursing. Premature babies are often not strong enough to nurse, as are also certain congenitally feeble infants, not premature. In such cases the milk should be taken with a breast-pump or expressed, and fed to the baby with a dropper, spoon, Breck feeder or bottle, or through a tube.

The English breast-pump is the one most commonly used and is fairly satisfactory. The breast will invari-

ably dry up in time, however, if a breast-pump is used continuously. The best method of getting the milk, therefore, is by expression. In this method the breast is grasped by the fingers and thumb from $\frac{1}{2}$ to 1 inch outside of the colored areola and a milking motion carried out toward the nipple, *i. e.*, first squeezing and then pulling. The breast is not massaged, as there is no more reason why a woman's breast should be massaged during milking than a cow's udder.

HUMAN MILK AND ITS SECRETION

COLOSTRUM

The milk secreted in the first few days is scanty in amount, of a deep lemon-yellow color, and somewhat thicker than that secreted later, and is known as colostrum. Its chemical composition is different from that of the milk secreted later. It is supposed to have a laxative action and to be of benefit to the baby in this way. The colostrum lasts for a number of days and then gradually changes to normal milk, the change being completed in the course of two or three weeks.

HUMAN MILK

Composition.—Human milk looks like cow's milk, but when it is cold small white flakes are apt to stick to the side of the bottle, which does not happen with cow's milk. It has no odor and its taste is sweet. The color varies from a rich, creamy yellow to a bluish white. It is impossible, however, to judge of the strength of the milk from its appearance. In fact, in the yellowest milks, the color is due to carotin, a coloring-matter present in certain vegetables and derived from them when they are



FIG. 7.—BREAST-PUMP.
(Courtesy of Jordan Marsh Co.)

eaten by the mother. Human milk is neutral in reaction. Average human milk contains from 3 to 4 per cent. of fat, 7 per cent. of milk-sugar, 1.50 per cent. of protein, and 0.20 per cent. of salts. The first milk at each nursing contains a few harmless bacteria, which come from the skin and larger ducts. The proportion of whey, or soluble proteins, is much larger in human than in cow's milk. The amount of salts, except of iron, is sufficient for the infant's needs. The salts of human milk are, moreover, in a form much more easily utilized by the infant than are the salts of cow's milk. The baby does not suffer, at any rate for many months, from the lack of iron in the milk, because it is born with a supply of iron in the liver.

The composition of human milk is essentially the same throughout the whole period of lactation, except that the percentage of protein diminishes somewhat as time goes on. The composition of the milk varies, however, from day to day, from nursing to nursing, and from the beginning to the end of each nursing. The variations in the composition are greatest in the fat, next in the protein, least in the sugar. The variation in the amount of fat during a single nursing is very marked, the percentage at the beginning varying from 2 to 3 and that at the end from 6 to 10. These facts show how careful we must be in estimating the value of the results of analyses of human milk. It is evident that a sample taken in the morning might be very different from one taken at night, and that one taken at the beginning of a nursing would certainly not be as rich as one taken at the end of the nursing. Unless the whole of the nursing is taken no confidence can be placed in the analysis, and but little unless the whole of several nursings is taken.

There is often considerable variation in the composition of the milk of different women, but, as babies thrive well on all of them, it is evident that there can be no absolute standard as to whether a breast milk is good or not. We cannot tell, therefore, from an analysis of a breast milk, unless there is some extreme variation, whether a given baby will thrive on it or not. Furthermore, a milk on which one baby does not thrive will often exactly suit another baby, and a milk which the second baby will not thrive on will, perhaps, be most suitable for the first baby. Most babies, however, will do well on almost any breast milk, and the same baby will often take the milk of several wet-nurses and apparently not know the difference.

Quantity of Milk.—The quantity of milk depends primarily on the individual, because, like cows, some women give more milk than others. In the next place, it depends on the amount of milk demanded by the baby. Within the individual's limits the supply varies with the demand, increasing when more is taken and diminishing when less is taken.

When a baby is thriving and gaining properly on breast milk it is evident that the supply must be sufficient. When a baby is not gaining it is possible that the amount may be insufficient. The only way in which the amount of breast milk which a baby is taking can be accurately determined is by weighing the baby before and after each nursing for twenty-four hours. It is not necessary to undress the baby to weigh it. The same result may be obtained by weighing the mother before and after each nursing, what she loses being, of course, what the baby gains. A baby normally gets one-half of its meal in the first five minutes of nursing, and an additional quarter in the second five minutes. It

gets only the other quarter no matter how much longer it nurses. The appearance of the breast is not a trustworthy guide as to the quantity of milk, because many large breasts secrete but little milk, and many small ones much milk. Crying for some time before the nursing is due suggests that the baby is not getting enough. It is more suggestive when the baby stops after a minute or two of nursing and cries, when it worries the breast, or when it continues to nurse more than twenty or thirty minutes. Sucking the fingers is a bad habit and not a sign of hunger.

It is impossible for a woman to increase the quantity of her milk by drinking large amounts of liquid. It is useless for her to drink more than 1 quart of extra liquid daily. There is nothing which can be applied to the breasts, and there are no drugs which can be taken internally, which will increase the supply of milk. The best stimulus to the secretion of milk, and the only thing which will constantly increase the supply to its maximum amount, is the complete emptying of the breast at each nursing.

Menstruation.—In general, neither the quantity nor the quality of the breast milk is affected by menstruation. There is no constant variation in the quantity, and analyses show no greater changes in the quality of the milk than occur from day to day when the mother is not menstruating. In certain instances, however, the baby's digestion is somewhat disturbed for a few days before or during the first days of the menstruation. This disturbance is usually not of importance. If it is marked, the baby should not be weaned, but should simply be fed on an artificial food for a few days at the menstrual period, the breasts being emptied with a breast-pump or by expression.

Pregnancy.—The milk usually begins to deteriorate soon after the beginning of pregnancy, becoming weaker and smaller in amount. It is unwise, therefore, for a mother to continue nursing long after she has become pregnant. It is hardly possible for her to nourish three individuals at once. The weaning, however, should be gradual in order that the nursing baby may not be disturbed.

Nervous Impressions.—Great excitement, anger, fear, or grief may stop the secretion of the breast milk wholly or in part, or so change its composition that it will make the baby ill. Women who are nervous and excitable are likely, moreover, to have a milk high in protein, which will often disturb the baby's digestion.

Elimination of Drugs in Milk.—Drugs taken by the mother may be excreted in her milk, rarely, however, in quantities large enough to do harm to the baby. A mother should remember this fact, however, when she is taking salicylate of soda, aspirin, iodid of potash, the bromids, urotropin, and antipyrin. No attempt should be made to treat the baby by giving drugs to the mother, because, if they are eliminated in the milk, the amount eliminated is variable and uncertain. Alcohol, even when taken in large amounts by the mother, is not excreted in the milk in sufficient amounts to do harm to the baby. It is possible that opium and atropin may be. The drugs which, when taken by the mother, are most likely to disturb the baby are the various cathartics and laxatives. If the baby has loose movements and the colic, this possibility should always be thought of.

Diet of the Nursing Mother.—In the first place it must be remembered that nursing is a normal, not a diseased, condition. There is no reason, therefore, why a woman who is nursing a baby should not eat the same food as

that to which she is accustomed when she is not nursing. There is no reason why she should not eat anything which does not disturb her digestion, but she should, as when she is not nursing, avoid articles of food which disagree with her. There is practically nothing in the old theory that a nursing woman should not eat acid fruits or vegetables on the ground that they will disturb the baby's digestion. It is true that sometimes, when a given woman eats a given food, her baby will be disturbed, but this fact does not imply at all that another woman cannot eat the same food without disturbing her baby. Moreover, the food which apparently causes disturbance in one instance will not in another. If a baby seems disturbed after a woman has eaten a certain article of food, she should eat it again. If the baby is disturbed the second time, this article should then be cut out of her diet.

It is useless for a woman to attempt to increase the quantity of her milk by taking a large amount of rich food or of liquids. If much rich food or a large amount of liquids is taken, one of two things happens—the mother either gets fat or her digestion is upset. Furthermore, she is usually prevented from taking a proper amount of proper food because the rich food and the excess of liquids destroy her appetite. She should never take more than a quart of extra liquid daily. This is best taken in the form of milk, gruel, or cocoa shells.

Modification of Breast Milk.—The quantity of milk can sometimes be diminished by diminishing the amount of food and liquid taken. If the breasts are not thoroughly emptied the supply will quickly diminish. External applications are practically useless and are not advisable. The frequent opening of the bowels will reduce the amount of milk temporarily. The best way to increase the

quantity of milk is to have the mother lead a normal life and eat a normal diet. Emptying the breasts at each nursing will increase the quantity of milk more than anything else.

If the milk is too rich in all its elements as the result of overeating and lack of exercise, the strength can be reduced by cutting down the diet and increasing the exercise. If the milk is too weak in all its constituents as the result of lack of food, it can be strengthened by proper food and care. The longer the intervals between the nursings, the weaker is the milk as a whole.

Unless the mother is much underfed, there is no way in which the fat in the milk can be increased by changing the diet. If the milk contains too much fat, it can sometimes be diminished by cutting down the amount of food in general. The amount of sugar in the milk cannot be increased or diminished in any way. The amount of protein in the milk can be increased to a certain extent by increasing the proportion of protein, and diminished somewhat by diminishing the proportion of protein in the food. If the protein is too high, as the result of nervousness, the usual cause, it can be reduced if in any way the mother's nervousness can be diminished. If it is too high from a lack of exercise, it can be diminished by exercise; if it is too high from fatigue, it can be diminished by rest.

THE TECHNIC OF NURSING

In the first place, the mother must take a position which will be comfortable for her to maintain for from fifteen to twenty minutes. This will usually be reclining on a bed or couch or sitting in a low chair without arms. The baby should be held lying on its side with its head a little elevated. It must be evenly supported, so that

it is relaxed and comfortable. The breast above the nipple should be pressed away from its nose, so that it can breathe freely. The mother and whoever else may be in the room must be quiet and composed. Otherwise the baby will be disturbed and excited and will not nurse well. The baby is less likely to vomit after nursing if the mother lies down on the bed beside it when she nurses it. If, as is often the case, the baby vomits because it swallows air while nursing, it may be prevented by holding the baby up every minute or two during the nursing period in order that it may raise it. It is also well, as a routine measure, to hold a baby up for a minute or so after each nursing in order that it may get up gas.

Difficulty in Nursing.—When a baby does not nurse well it may be because it is uncomfortable or excited. The difficulty is sometimes due to some deformity of the lips or mouth, but more often to nasal obstruction from adenoids or a cold in the head. Weakness is also not infrequently the cause of poor nursing. Babies that have been fed on the bottle usually refuse to take the breast at first, and babies that get both the breast and the bottle often refuse the breast because they can get milk more easily from the bottle. Retracted or small nipples are a frequent cause of difficulty in nursing. In rare instances the nipples are too large. Cracked nipples often interfere with nursing.

Care of the Nipples.—The care of the nipples should be begun during pregnancy. Retracted nipples may often be improved by manipulation, the application of a breast-pump, or sucking. The nipples should be washed with sterile water or with a saturated solution of boric acid after each nursing, and carefully dried with absorbent cotton or a soft cloth. They should be protected between nursings by a cloth wet with albolene or smeared with

boric acid ointment. Washing the nipples with a 50 per cent. solution of alcohol will often toughen them, if they are tender. If the nipples become cracked, a nipple-shield should be used. If the baby does not empty the breasts in this way, they should be emptied by expression. Time, patience, cleanliness, and some simple ointment, like boric acid ointment, will usually heal them. If they do not, there are other methods of treatment, which can only be used safely by a physician, which will.

Inflammation or Caking of the Breasts.—If the breasts are inflamed or caked, they should be supported by a breast-binder, and a physician called. It is never safe for a woman to take any chances with an inflamed or caked breast.

Care of the Baby's Mouth.—It is not wise to wash the baby's mouth after nursing. It is far more likely to become inflamed if it is washed than if it is let alone. A swallow of water after the nursing is all that is necessary.

Intervals between Nursings.—There is much difference of opinion as to the proper intervals between nursings, according to the location in which the baby happens to live, and the doctor or nurse which it happens to have. The tendency, in general, is to make the intervals rather longer than has been the custom in the past. The babies that are on breast milk do so well at all intervals, however, that it is evident that the intervals cannot be of extreme importance. We feel that the wisest plan is to feed the baby at two or two and one-half hour intervals until the baby is from four to six weeks old, continuing with the three-hour interval until the baby is weaned. The single night feeding between 10 P. M. and 6 A. M. should be dropped at any rate by the time the baby is two or three months old. The 10 P. M. feeding may be dropped when it is six months old.

Regularity in Nursing.—Whatever intervals are adopted the baby must be nursed regularly at these intervals. It is true that many breast-fed babies do well even though they are fed at irregular times. They are more likely to do well, however, if they are fed regularly, and it is much easier for the mother. A baby quickly becomes accustomed to being nursed at certain intervals and does not expect to be fed except at these intervals. Moreover, when a mother knows just when she is to nurse her baby, she can arrange her other duties and feel sure that she can attend to them. If a mother is so situated that she has to take the entire care of her baby and of her household, it is easier for her not to give the baby anything but the breast. If, however, she has someone to help her in the care of the baby or someone with whom she can leave it, it is usually better for her to give the baby, after the first few weeks, one artificial feeding a day, because in this way she can get one long interval each day in which she can fill other engagements or amuse herself. Many women, moreover, have more milk and can nurse longer if they have more opportunity for exercise and amusement. Other advantages of one artificial feeding a day are that the baby becomes accustomed to the bottle and it is known what artificial food it can digest, so that, if for any reason it has to be weaned suddenly, there is no trouble in doing it.

Sleeping With Mother.—A baby should not sleep with its mother and should not be nursed off and on all night. If it does, the sleep of both mother and baby is disturbed and both suffer from it.

Waking to Nurse.—The baby should be waked to nurse if it is asleep when the nursing hour comes around. Most babies wake and are ready at the appointed time.

If they are not, they will quickly drop to sleep again after the nursing.

Alternate Breasts.—When the supply of milk is sufficient, it is advisable to give the breasts alternately. In this way the breasts are thoroughly emptied, and the secretion of milk is encouraged. If there is not a sufficient supply of milk, both breasts should be given at the same feeding, but the breasts should be given first alternately, that is, the right breast first at one feeding and the left breast at the next feeding. In this way one breast is certain to be thoroughly emptied at each feeding.

The Length of a Single Nursing.—If there is a good supply of breast milk, the average baby will usually nurse about twenty minutes. This is merely an average time and not an arbitrary time, as many people suppose. Many normal babies get all that they want in ten or fifteen minutes. Some babies take a little more than twenty minutes. If the baby nurses more than thirty minutes, however, there is something wrong. It may be that the supply of milk is insufficient or that the baby is too feeble to nurse continuously and vigorously. A baby should not drop off to sleep while nursing. If it does, it means that there is not enough milk, that it is feeble and gets tired, that it is sick, or that it is not hungry. It is important to remember in this connection that the milk flows more freely at the beginning of nursing, that the baby gets one-half of its meal in the first five minutes, and another quarter in the next five minutes.

Amount Taken at a Single Nursing.—The amount of milk taken at a single nursing varies materially and bears no relation to the theoretic size of the baby's stomach. The reason that a baby takes different amounts at different feedings is that it is hungrier at some feedings than

at others. If it has taken a small feeding at one time, it will naturally take a larger one the next time, and vice versa. It will want more if it has been exercising than if it has been asleep. It will take more at a feeding if the intervals are long than if they are short. The amount of milk taken in twenty-four hours is, however, approximately the same from day to day, gradually increasing, of course, as the baby grows older. The amount taken at a feeding also depends on the supply available in the breast at the given time. The reason that a baby can take more at a single feeding than its stomach can hold is that the milk passes from the stomach into the intestines while it is nursing.

MIXED FEEDING

If a mother does not have enough milk for her baby it should not be weaned, but should be given artificial food in addition to the breast milk. If the supply of breast milk is almost sufficient, the baby may be given the artificial food entirely at one or two feedings in place of the breast. It is never advisable, however, to omit more than two breast feedings daily, because, if more nursings are omitted, the supply of milk invariably diminishes further from lack of stimulation of the breasts, and often dries up. If the supply is much diminished, the breast should be given first at each nursing, followed by an artificial food. The amount of artificial food to be given depends, of course, on the quantity of breast milk. This can be determined by weighing the baby before and after nursing until the average amount is known. Enough artificial food is then given to make up the proper amount. It is often sufficient, however, to simply give the baby enough of the artificial food to satisfy it, without regard to the amount.

THE NORMAL BREAST-FED BABY

The normal breast-fed baby gains from 6 to 8 ounces a week during the first five months, and from 4 to 6 ounces a week during the rest of the nursing period. It usually doubles its weight in the first five months, and trebles it in the first twelve or fifteen months. Smaller gains, if steady, are, however, not abnormal. A mother must not be disturbed because her baby does not weigh just as much as some other baby of the same age. The two babies do not have the same parents and there is, therefore, no reason why they should be any more alike than are their parents. Theoretically, a normal baby should gain weight every day; practically, it almost never does. It gains one day and loses the next. It should, however, make a gain every week. Failure to gain for one or two weeks does not, however, necessarily mean that there is anything very serious the matter with the baby. It may be that the mother for some reason has less milk for a week or two, that the baby's appetite is not quite as good, or that it has some slight indisposition not easily recognizable.

The normal breast-fed baby has from two to four smooth, orange-yellow stools of the consistency of pea-soup daily during the first few months, and from one to three of somewhat greater consistency during the rest of the nursing period. These stools have a peculiar, slightly acid odor and are acid in reaction. They do not, however, irritate the buttocks. It is not abnormal, however, for a baby that is gaining and thriving to have a smaller number of stools of greater consistency. The explanation probably is that the supply of milk is somewhat limited, so that there is not enough residue to give the usual number of stools. Many breast-fed babies that are apparently well in every other way and are gaining have

abnormal stools. These stools may be loose and green and contain many curds and considerable mucus. The baby may have many of them daily. Abnormal stools of this sort usually indicate that the milk is not perfectly suited to the baby, and an effort should be made, therefore, to improve the quality of the milk. When the baby is apparently well and is gaining, it should, however, never be weaned because the stools are abnormal. The meaning of stools of this type is entirely different in the breast-fed baby from what it is in the artificially-fed baby. Many babies never have a normal movement while they are on the breast and yet thrive perfectly in every way. If they are taken off of the breast because of the abnormal stools they are likely to continue to have abnormal stools on any and all artificial foods and are almost certain not to thrive as well. Many babies have been killed and many more have had chronic disturbances of digestion because they have been taken off of the breast simply because the stools were not normal.

The normal breast-fed baby should not vomit unless it is disturbed in some way soon after eating or has taken too large a feeding. It should sleep from twenty to twenty-two hours in the twenty-four hours during the first two months and about sixteen hours during the latter part of the year. It should cry only when it is hungry, uncomfortable, or sick, that is, assuming that the baby is properly brought up and not spoiled.

THE ABNORMAL BREAST-FED BABY

When a breast-fed baby that is not gaining in weight does not vomit and has one or more normal stools daily, the reason for its failure to gain is almost never to be sought in the food. There is something else the matter with the baby.

When a breast-fed baby does not gain, shows no signs of indigestion, such as vomiting, gas, colic, or undigested stools, but is constipated, the difficulty usually is that the supply of breast milk is deficient in either quantity or quality. The trouble is more often in the quantity than in the quality. Many babies will not appear hungry if they get enough milk to supply the immediate pangs of hunger, although the amount is not sufficient for them to gain on. The remedy is obvious. The supply of breast milk must be increased or artificial food must be given in addition.

Other babies that are not gaining and some that are gaining show various manifestations of indigestion, such as vomiting, gas, colic, and abnormal stools.

Vomiting.—The vomiting may be due simply to an excess of food. If this is the cause, the vomiting usually occurs immediately after nursing and the milk has the same appearance as when it was taken. The vomiting may also be due to handling after nursing or the baby may be too active, the food being forced out of the stomach by the handling or by the activity. In some cases the vomiting is due simply to the fact that the muscle which closes the upper opening of the stomach is not as strong as usual and cannot resist the pressure of the abdominal muscles. The remedy for too much handling is plain. The activity of the baby immediately after nursing can be regulated to a certain extent. When the muscle is weak, time alone will help. In some instances the vomiting is due to air which is swallowed by the baby while nursing. The vomiting can be helped in such cases by holding the baby up and patting its back every minute or two during the nursing. In other instances the vomiting is due to the fact that the milk is in some way of poor quality. Usually it contains too much fat or protein.

Gas and *colic* are often due to the swallowing of air during nursing. They may also be due to an excessive amount of milk which is not properly digested, but are more often due to some abnormality in the quality of the milk. This abnormality is in most instances an excess of protein, almost never an excess of sugar and seldom an excess of fat. It is sometimes very hard to tell whether a baby is crying from the colic, because it is uncomfortable for some other reason or because it simply wishes to be picked up. If it is crying to be picked up, it will stop when it is picked up and begin again when it is put down. Other causes for discomfort, such as misplaced pins and wet diapers, should always be excluded before attributing crying to colic. A baby with the colic almost always pulls up its legs and is helped by being turned on to its abdomen.

Diarrhea.—An excessive number of loose stools is sometimes due to an excessive amount of breast milk. In such cases the stools are usually normal, except that there are too many of them and that they are too loose. Sometimes they contain small curds. When the stools are also green and contain curds and mucus the cause is usually some abnormality in the milk. This is almost always an excessive amount of protein, almost never an excessive amount of fat or sugar. The causes of an excessive amount of protein in breast milk are, as already mentioned, usually nervousness, lack of exercise, or fatigue. The removal of these causes will usually result in the disappearance of the green stools.

Constipation.—Breast-fed babies are seldom constipated. If they are, the usual cause is a limited supply of breast milk, there not being enough residue to produce the usual number of good-sized stools. Sometimes, if the stools are very light colored and dry, the trouble

is an excess of fat in the breast milk. This can be diminished by cutting down the mother's diet and having her take more exercise.

In any case, constipation is the least of all evils in a breast-fed baby and ought not to cause any anxiety. Many mothers worry most unnecessarily about what they think is constipation, when there really is nothing the matter with the baby. Constipation is of more importance in the artificially-fed baby, but even then is much less serious than is usually supposed.

It must be remembered in this connection that it is not necessary for every baby to have a movement every day, and that the consistency of the stools may vary normally in different babies. If a baby is not uncomfortable in any way and has a good appetite, it will do it no harm to miss a day. It is not wise, however, to let it skip more than two days. If it is necessary to move the bowels of a breast-fed baby, it is usually wiser to use an enema or a suppository than to give any drug by the mouth, because the trouble is usually in the rectum and not higher up. If the stool is soft and passed easily when it is passed, the delay is not due to constipation, but to laziness. In some instances the delay in having stools is due to an unusual tightness of the muscle at the anus. If this is stretched with the finger a few times the constipation will be relieved.

It must never be forgotten that indigestion in breast-fed babies may be due to other causes than disturbances of the quality and quantity of the breast milk. It may be that the baby is handled and played with too much, that it is not allowed to have a sufficient amount of rest, that it is excited too much, that it doesn't have enough air and sun, that it is kept too hot or too cold, or, finally, that it has some other disease of which the indigestion is a symptom.

Chapter V

WET-NURSES

THERE can be no doubt that the most suitable food for a baby that cannot be nursed by its own mother is the milk of another woman. Sometimes, indeed, the milk of another woman is better for it than its own mother's milk, because the other woman has a better physique, temperament, and milk. In former times so little was known about artificial feeding that most babies whose mothers were unable to nurse them died unless they had wet-nurses. Nowadays, however, the artificial feeding of babies has been so much improved that most normal babies can be satisfactorily fed artificially and wet-nurses are unnecessary. When babies are premature, feeble, or have disturbances of digestion and nutrition, however, they almost always do much better with a wet-nurse than on any artificial food. In fact, many babies can be saved by breast milk that would certainly die without it. Other babies that might eventually be pulled through on artificial food can be saved months of illness, and their parents months of anxiety, by breast milk. Our rule has always been not only never to allow a baby to die, but never to allow a baby to get into a condition in which it may die of disturbances of nutrition or of digestion without getting a wet-nurse, provided a wet-nurse can be procured. If the parents are unwilling to get a wet-nurse, we feel that it is our duty to require them to call another physician.

Wet-nurses are much like other people—good, bad, and indifferent, mostly indifferent. Like other people, how

they conduct themselves depends largely on how they are treated. Many of them are blessings in a home, others are the opposite. A family should, however, be willing to put up with more or less discomfort or annoyance for the sake of saving a baby's life. Household difficulties are not to be compared with the illness of a baby.

Every mother naturally dislikes to have another woman nurse her baby. She should remember, however, that, if she was doing her duty by her baby, it would not be necessary for another woman to nurse it. She should also not only be willing, but glad, to sacrifice her own feelings for the good of her baby. It is impossible for mental, moral, or physical characteristics to be transferred from the nurse to the baby. If it was possible, it would often be far better for babies to have wet-nurses than to nurse their own mothers. It makes no more difference to the baby what is the race, color, or disposition of the wet-nurse than does the race, color, or disposition of the cow which gives it milk. The important thing is that the milk is of good quality and sufficient in amount.

Qualifications of a Wet-nurse.—A wet-nurse must be healthy and free from syphilis, tuberculosis, and other chronic diseases. These points can only be determined by a careful physical examination by a physician and a Wasserman test on the wet-nurse. Care should be taken that the baby that the wet-nurse is to nurse is not a syphilitic. It is just as bad to have the baby infect the wet-nurse as the wet-nurse the baby. The only way in which the quantity of the wet-nurse's milk can be determined is by the appearance of her baby and by the amount which her baby gets in twenty-four hours, this being determined by weighing her baby before and after each nursing. It is useless to analyze the milk to

determine its quality, both because of the possibility of mistakes in the analysis and because it is impossible to know from the analysis whether it will agree with the baby or not.

As the composition of human milk is essentially the same from the end of the colostrum stage throughout the period of lactation, it is not necessary that the foster baby and the nurse's baby be of the same age. It is not wise, however, to employ a woman whose baby is eight or nine months' old, as her milk is likely to give out too soon.

If a feeble or young baby is put to the breast of a woman who has an abundant supply of milk, it will not be able to empty the breast and the supply of milk will quickly diminish on this account. Many good wet-nurses have been ruined in this way. It is a great advantage, therefore, under these conditions for a wet-nurse to have her own baby with her to empty the breasts. It must also be remembered that a small or young baby may be upset by taking too much food from a well-filled breast. This accident may be prevented by limiting the duration of the nursing and weighing the baby before and after nursing in order to find out how much it is getting.

The Management of Wet-nurses.—A wet-nurse should be given the sort of food and made to do the sort of work to which she has been accustomed. If she is not, she is likely to be made ill. A woman who has been used to doing hard work and eating coarse food should continue to do so while nursing, while a woman who has been used to an easy life and more delicate food cannot be expected to do hard work and eat coarse food. It is wiser to have a wet-nurse bring her own baby with her. If she has more than enough milk for the foster baby, she can give it to her own baby and thus prevent the drying up of

her milk. If she does not have more than enough for the foster baby, her own baby is fed artificially. A wet-nurse is likely to be happier if she has her baby with her and thus to have more and better milk. A wet-nurse is supposed to take entire care of her own baby and some care of the foster baby. In some instances she also does the washing of the foster baby.

Methods of Procuring Wet-nurses.—A wet-nurse can almost always be found if she is sought for with sufficient energy. The first places to look are the maternity homes and hospitals. Physicians and district nurses often know of women who would be willing to be wet-nurses. In Boston there is a directory for wet-nurses. In many instances when a wet-nurse cannot be procured, breast milk can be taken from one or more women and fed to the baby in a bottle. Contrary to the common impression, there is no more danger in mixing the milk of several women than of mixing that from a number of cows. Breast milk will keep as well on ice as will cow's milk, better, in fact, because it is almost always taken in a more cleanly manner.

It is sometimes said that it is wrong to employ wet-nurses because it is immoral to deprive one baby of its natural food and give it to another. This objection is not valid, because women who go out as wet-nurses do not do so for pleasure, but because they have to earn money for themselves and their babies. If they do not go out as wet-nurses, they have to wean their babies and board them. When they go as wet-nurses they make higher wages than they would otherwise, get a good home for themselves and their babies, and can keep their babies with them.

Wet-nurses are expensive, but the expense of a wet-nurse does not compare with that of an artificial food, doctor's bills, and trained nurses.

Chapter VI

WEANING

A BABY should never be weaned unless there is a good reason for doing it. It should not be taken off of the breast during the early days or weeks just because the supply of milk seems to be insufficient or the baby cries and has undigested stools. It is much wiser to wait until the mother has been up and leading her usual life for a time before considering weaning, because in many instances both the quantity and quality of the milk will improve after she is out of bed. On the other hand, it is important not to wait too long before giving some artificial food in addition to the breast milk. A baby should never be weaned because of cracked nipples, because these can almost invariably be cured and the nursing continued. Menstruation is not an indication for weaning. In fact, more women menstruate during the nursing period than do not. If the baby is upset during the menstruation, it may be taken off of the breast for a few days and then put back again. Pregnancy is an indication for weaning, but the weaning should be slow, not immediate.

It is often necessary to wean a baby because its mother has some acute disease. If the disease is contagious, the baby should be weaned to protect it from contagion. Young babies are not likely to contract contagious diseases, however, because they are born with a considerable degree of natural immunity to them. If the disease is not contagious, the question of weaning must be decided

on the circumstances in the individual case, the decision depending on the severity of the mother's illness, the amount of the diminution of her milk, and the general condition of her baby. The development of a chronic disease in the mother is usually an indication for weaning, because the strain of nursing favors the progress of the disease. If the baby is very young, however, the mother should nurse the baby as long as she can in justice to herself, because breast milk means so much to the young infant. If the baby is older and thriving, it should be weaned quickly for the sake of the mother.

In many instances the breast milk gives out and it is not necessary to decide when to wean a baby. If it does not, the baby should be weaned when it is between ten and twelve months old. Babies rarely thrive on breast milk alone for more than a year. They are likely to become anemic and flabby. If the baby is doing fairly well on the breast, it is usually wise to continue nursing through the summer, even though the baby will be a little more than a year old in the autumn, because breast-fed babies are so much less liable to disturbances of digestion than are the artificially-fed. A baby should never be weaned in the spring to avoid weaning in the summer, because the older it is, the better able it is to take an artificial food. It is no more liable, moreover, to have indigestion from artificial food in the summer, when it is weaned in the summer, than when it is weaned in the spring.

It is advisable, if possible, to wean babies slowly. It is much easier for both the mother and the baby, and the baby is much less likely to be upset by the change to artificial food. Moreover, if it is upset, it can be put back on the breast again and the breast milk will usually quickly return. Weaning is much easier if the baby has

been accustomed to taking one bottle of artificial food daily. Sometimes when a baby has had nothing but the breast, it will refuse to take anything else. In such cases it is best to separate the mother and the baby. At any rate, someone else must give it its food, because it expects breast milk and nothing else from its mother. When a little baby is weaned it should be given its food in a bottle. When an older baby is weaned it should be taught to take its food from a spoon or glass. If a baby refuses to take its food after reasonable urging it should be allowed to go hungry until it will take it. This usually happens in from twenty-four to forty-eight hours. Sometimes, however, babies will continue to refuse to take anything but the breast and have to be fed for a time with a tube in order to save them from starvation.

When a baby has been taking one feeding of artificial food daily it is simply given more feedings of this food as it is weaned. When it has not had a feeding of artificial food considerable care must be taken in prescribing the new food. In general, it is wise to begin with a food somewhat weaker than would be given to a baby of the same age that had been artificially-fed.

Chapter VII

THE GENERAL PRINCIPLES OF ARTIFICIAL FEEDING IN THE FIRST YEAR

The Food Elements.—There are only a few food elements. A food must contain some or all of these elements. It cannot contain any other elements which serve as food. These elements are fat, carbohydrates, protein, and salts. There are two sorts of carbohydrates—the sugars and the starches.

A baby in order to thrive and gain must get a sufficient amount of food. This amount of food cannot be calculated in ounces and pints, but must be calculated in calories or food units. This is evident when we consider that a given amount of food may be very weak and consequently contain but few calories, while a smaller amount of food may be strong and contain many more calories, that is, it is not the bulk of the food which is important, but its content in calories.

A baby must not only get a sufficient amount of calories in its food, but it must get enough protein to cover its body waste and to form new tissues. Protein is the only food element which can replace the waste of the tissues and from which new tissues can be formed. Fat and carbohydrates merely serve to carry on the work of the body, being used up in combustion.

The food must also contain a sufficient amount of salts to provide for the chemical needs of the body and for the formation of new tissues. These salts must also be present in the proper proportions. Furthermore, the

food must contain a sufficient amount of the accessory food factors, or vitamins, which are essential for normal growth and development.

A food to be suitable for a baby must not only contain the proper amount of calories, protein, and salts, but they must be present in such a form that they can be utilized by the baby. A cheese sandwich with plenty of butter contains all the food elements and a sufficient amount of protein, but is hardly a suitable food for a baby of three months. Sawdust has a high caloric value, but not even a donkey can survive on sawdust. Further than this, the food must also be suited to the digestive powers of the individual baby, because a food which fulfils all the theoretic requirements and which is easily digested by one baby may cause indigestion in another.

The baby's food is best prepared from the milk of some animal, because the milk of animals contains the same food elements that are present in human milk. It contains no other elements and contains all the vitamins. Furthermore, it is intended for the growth and development of a young animal. No other food has these characteristics. It must not be forgotten, however, that the milk of an animal is intended for the young animal of the same species, and not for the human animal, that is, the baby. No other animal develops, grows, and matures in the same way as a baby. The milk of no animal is exactly suitable, therefore, for a baby. Hence it usually has to be modified in some way to meet a baby's needs. Some babies, however, will thrive on the undiluted whole milk of an animal.

The milk of the cow is more suitable for the preparation of a baby's food than any other, because it can be procured almost anywhere and in sufficient amounts. It is sometimes said that **goat's milk** is better for babies

than cow's milk. There is no justification for this statement. Goat's milk is no more like human milk than is cow's milk and, therefore, also needs to be modified. The reasons why goat's milk used to be considered better than cow's milk were probably because goat's milk was given to babies when it was fresh and cow's milk when it was old, and because in the countries where goat's milk was most used the cows were tubercular and the goats, on account of their resistance, were not. These reasons do not apply, however, in this country at the present time, as pure milk from non-tubercular cows can now be procured by anyone who wishes.

Cow's MILK

The appearance of cow's milk is familiar to all. It is practically odorless and has a slightly sweet taste. It is neutral in reaction when it leaves the cow, but is more or less acid when it reaches the consumer. It contains, on the average, 4 per cent. of fat, 4.50 per cent. of milk-sugar, 3.50 per cent. of protein, and 0.70 per cent. of salts. A large proportion of the protein is in the form of casein, or insoluble protein. Hence it forms larger and harder curds than human milk. The composition of the salts is different from that in human milk. The amount of salts is greater, but they are less easily utilized by a baby. The fat globules are larger, and the proportion of fatty acids is greater, that is, the fat is in a less easily digestible form than in human milk.

Bacteria in Cow's Milk.—Cow's milk always contains, as does human milk, a few bacteria, which originate in the milk ducts. Most of the bacteria, however, get into the milk during milking. Unless great care is taken they are very abundant by the time the milk reaches

the baby. These bacteria may be organisms which produce specific diseases like diphtheria, typhoid fever, or tuberculosis, or simply those which sour the milk. Many of the bacteria which milk contains are not harmful to a baby. The bacterial count, therefore, does not always form a safe guide as to whether a milk is dangerous or not.

Milk of Different Breeds of Cows.—The milk of Ayreshire and Holstein cows is much more suitable for babies than is that of Jerseys and Guernseys, because it contains less fat, the fat is more finely divided, and the proportion of volatile fatty acids is lower. The milk of Ayreshires and Holsteins should, therefore, always be used if it can be obtained and is clean. Some babies can take Jersey milk without being disturbed. Many others cannot, however, and it will often be found that when the kind of milk is changed a baby can take without trouble the same modifications which made it sick before.

Mixed Milk Versus the Milk of One Cow.—Other things being equal, it is better to use the mixed milk of a herd in preparing a baby's food than the milk of one cow. The reason is that, if the milk comes from one cow and this cow is ill in any way, the baby is almost certain to be upset, whereas, if one or two cows in a herd are ill, their milk will be so diluted by the milk of the others that the baby will probably not notice it. On the other hand, it is evident that the milk of one healthy cow that is properly taken and properly cared for is preferable to the milk of a herd which is not properly taken care of.

Inability to Take Cow's Milk.—It is often said that a baby cannot take cow's milk in any form without being made sick by it. In most instances, however, the trouble

is not with the cow's milk, but with the way in which it has been prepared for the baby. Almost all babies can take cow's milk if it is properly modified to suit the individual baby's digestion. In some cases, however, the symptoms are really due to a sensitiveness (anaphylaxis) to the protein of cow's milk. If this is the case, a skin test made with the casein of cow's milk will usually be positive. If the baby is sensitive to cow's milk, it must be given either breast milk or goat's milk. This sensitiveness is usually gradually outgrown during early childhood. If not, the baby may be desensitized by giving it minute doses of cow's milk and gradually increasing the amount until immunity is established.

Frozen Milk.—Babies are not infrequently made ill by taking frozen milk. The explanation is not quite clear, but the trouble is probably due to changes in the size of the fat globules and in the proteins. It is advisable, therefore, not to give milk which has been frozen to babies.

PURE OR CLEAN MILK

By this term is meant not simply milk which does not contain dirt and manure and is not adulterated, but milk which does not contain the bacteria which produce specific diseases and only a limited number of others. Such milk can only be produced and delivered in cities when the greatest attention is paid to every detail of its production. Such attention necessarily materially increases the cost of the milk. When such milk is produced and distributed under the direction of Milk Commissions it is known as a *certified milk*. Reasonably pure milk can be obtained in the country, however, provided the cows are not tuberculous, the milk is taken under fairly cleanly conditions, strained, and immediately

put on the ice and kept there. The limited production and expense of *certified milk*, the possibility of its contamination, even when the greatest care is taken in its production, the chance of contamination and carelessness in looking after it in the home, and the difficulty in keeping the milk cool, especially in hot weather, with the consequent increase in its bacterial content, have led many to believe that it is wiser to use *pasteurized* or *boiled milk* in the preparation of foods for babies than to attempt to get a pure raw milk.

PASTEURIZED AND BOILED MILK

There has been and still is much difference of opinion as to whether pasteurizing or boiling milk makes it less suitable as a food for babies. It is safe to say that the proper pasteurization of milk does not interfere with its digestibility, does not favor the development of rickets, and impairs but little the potency of the antiscorbutic vitamin. The boiling of milk makes the casein more digestible and does not favor the development of rickets, but does materially diminish or destroy the antiscorbutic vitamin. This impairment is not important, however, as the antiscorbutic vitamin can be easily supplied by giving orange juice, lemon juice, or tomato juice. Boiling milk also destroys certain ferments in it, which, however, are probably not of great importance. Nevertheless, we cannot help feeling from clinical experience that babies thrive somewhat better on raw than on pasteurized or boiled milk.

Proper pasteurization destroys the organisms of typhoid fever, tuberculosis, diphtheria, dysentery and cholera, and the other non-specific, non-spore-bearing organisms. Pasteurized milk is not entirely sterile, however, and will

go wrong after a time, just like raw milk, even if kept in a cool place. Boiling milk, even for a few minutes, destroys all but the spores of a few organisms. It does not destroy all the poisons formed in milk by bacteria. Boiling milk does not, therefore, always make it harmless.

Whether or not babies thrive somewhat better on raw than on pasteurized or boiled milk, there is no doubt that the potential dangers from infection with the bacteria of specific diseases, or with those which produce diarrheal conditions through raw milk are greater than any possible disturbances of nutrition from pasteurizing or boiling. A wise rule seems to be, therefore, in the city to use in the winter pasteurized or boiled milk, unless a certified milk can be obtained, and in the summer to pasteurize or boil even a certified milk. In the country, if the cows are free from tuberculosis, the source of supply near at hand, and the milk reasonably clean, it is not necessary to pasteurize or boil except in the summer. If the cows are not tested and the milk not clean it is advisable to pasteurize or boil it even in the winter.

PASTEURIZATION IN THE HOME

There are several good pasteurizers on the market. The one sold by the Walker-Gordon Laboratory Company is a good one, as is also the one designed by Dr. R. G. Freeman, of New York, and known as the Freeman Pasteurizer. It is not necessary, however, to have any special apparatus for the pasteurization of milk in the home. Any dish of sufficient size and depth will do. Each feeding should be placed in a separate, clean, boiled bottle. The bottle is then tightly stoppered with clean non-absorbent cotton and is placed in a dish of cold water, the water in the dish being at the level of the

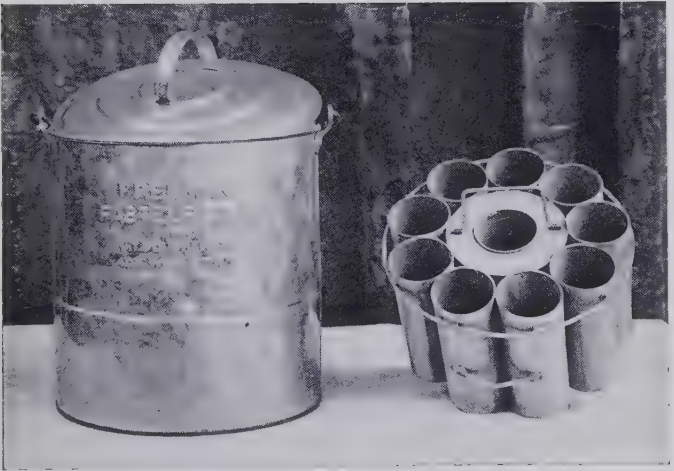


FIG. 8.—FREEMAN PASTEURIZER.
(Courtesy of Jordan Marsh Co.)

milk in the bottles. The bottles are less likely to break if they are stood up in a rack. The dish is then placed on the stove and kept there until the thermometer suspended in the water registers 145° F. The dish and its contents are then taken off of the stove, covered with a blanket, and allowed to stand for thirty minutes. The milk is not pasteurized unless it is covered and allowed to stand. The bottles are then taken out, cooled quickly, best in running water, and kept in a cold place until used.

MODIFIED MILK

The composition of human milk teaches us certain things as to the digestive capacity of babies and the general principles to be followed in the preparation of a food to meet this capacity. The human breast secretes a dilute food, rich in fat and carbohydrates, and relatively low in protein, that is, rich in heat-producing elements and relatively low in tissue-building elements. It is reasonable to suppose that this type of food is the one best suited for the digestive powers and internal chemical processes of an infant. Experience shows that, by and large, babies thrive best on foods of this sort. We believe, therefore, that well babies should be given foods of this type. We do not mean by this statement that we are attempting to imitate breast milk or to make a food like breast milk, because this is impossible. We do not mean that all babies should have the same strength of food. Experience shows that the strength of the food must vary with the age of the infant and that different babies of the same age require different strengths of food, although human milk is of essentially the same strength throughout the whole period of lactation. Experience also shows that, although human milk

becomes weaker toward the end of lactation, babies do better when the food is weak in the beginning and gradually strengthened as they grow older. This general principle of foods, relatively high in fat and carbohydrates and relatively low in protein, cannot be applied to the feeding of sick babies. In them the food must be fitted to the needs of the individual infant. Furthermore, some well babies do not thrive on this type of food. While it is the one most suitable for the great majority of babies, it does not suit all.

Comparison of Cow's Milk and Human Milk.—A comparison of cow's milk with human milk shows that whole cow's milk does not meet the indications given above.

TABLE I

	Fat, per cent.	Sugar, per cent.	Protein, per cent.	Salts, per cent.
Cow's milk.....	4.00	4.50	3.50	0.70
Human milk.....	4.00	7.00	1.50	0.20

That is, while the percentage of fat in the two milks is the same, the percentage of sugar is lower, and the percentage of protein considerably higher in cow's milk. The food value of the two milks is nearly the same, but the infant has to use protein instead of sugar to produce heat. It requires more energy to utilize protein for the production of heat than it does to use sugar. Furthermore, the end-products of the utilization of protein throw more work on the kidneys than do the end-products of sugar. Consequently, the baby works at a disadvantage when it has to use protein instead of sugar. That is, proteins are intended to be used as tissue builders, not as fuel.

If the milk is diluted in order to lower the percentage of protein to the point where it meets the protein needs

of the baby, the percentages of fat and sugar are also lowered, and lowered too much. For example, if whole milk is diluted one-half, that is, with an equal amount of water, it contains fat 2 per cent., milk-sugar 2.25 per cent., and protein 1.75 per cent., making the fat 2 per cent. and the sugar about 5 per cent. lower than it is in human milk. Such a food will not provide a sufficient number of calories. The lack in calories may be made up by the addition of sugar, but the fat will still be lower than is advisable. We believe, therefore, that whole milk and dilutions of whole milk, even when sugar is added, do not meet the food requirements of babies in the best way, and are not, therefore, the most suitable foods for infants. We know very well that many babies thrive and gain on them. We believe, however, that babies do not do this because of any advantages in these mixtures, but in spite of their disadvantages. They are handicapped unnecessarily, but are strong enough to overcome the handicap. Parents and, unfortunately, many physicians say that this is the easiest way to feed babies and that, if babies get on with it, why not use it. It may be the easiest way, but we believe that it is not the best way. While many babies do well on it, many others do not. It is the duty of parents to do the best thing for their babies, not the easiest.

THE FUNDAMENTAL PRINCIPLE OF THE MODIFICATION OF MILK

When milk stands, the fat rises to the top, while the sugar and protein remain approximately evenly divided throughout. The upper portion, containing the fat, is known as cream. When cream is obtained by use of the

separator, the sugar and protein still remain approximately the same in the cream and separated milk. Any milk which, after separation or rising, contains more than 4 per cent. of fat is technically cream. This fact of the unequal division of the fat in the cream and skimmed milk, while the sugar and protein remain about the same in both, makes it possible to prepare foods for babies containing the various food elements in the same relations in which they are present in human milk. For example, if gravity cream, the average composition of which is fat 16 per cent., sugar 4.20 per cent., protein 3.05 per cent., is diluted with 3 parts of water, the mixture will contain fat 4 per cent., sugar 1.05 per cent., protein 0.76 per cent. When the percentage of sugar is raised by the addition of dry milk-sugar the relation of the food elements in human milk is obtained.

Any percentage of fat desired can be obtained by varying the dilution of the cream, any percentage of sugar by adding dry sugar, and any percentage of protein by adding skimmed milk, which contains protein and milk-sugar, but so little fat that it may be disregarded. In this way the composition of the food can be varied to suit the digestive powers of the individual infant, and, at the same time, the general relation of the food elements present in human milk retained.

FEEDING IN PERCENTAGES

The essential elements in the baby's food are the fat, carbohydrates, protein, and salts, not the strength of the cream and milk by which they are provided. It is the percentage of these elements which counts. The cream and milk are merely the vehicles which carry them. In calculating foods for babies physicians should always

think, therefore, in percentages of the food elements in order to fit the food to the individual baby's digestion. The average mother can hardly be expected to do this, however, and is almost certain to get into trouble if she tries. When foods are prepared at milk laboratories they are almost always ordered in percentages of the various food elements; when they are prepared in the home, the physician, in order to make it easier for the mother, figures out the amounts of cream, skimmed milk, and dry sugar required to give these percentages.

LABORATORY VERSUS HOME MODIFICATION OF MILK

Modified milk can be prepared in either a laboratory or the home. It can be prepared more accurately in a laboratory, because the laboratory can control the composition of the milk which it uses better than can the mother or nurse. Whether it is prepared more accurately or not depends on the care taken by the workmen in the laboratory. The management of the laboratories intends to have the milk accurately prepared. The workmen, however, are human and, like other humans, make mistakes. In our experience laboratories make no more mistakes than mothers. We have never known a mother to prepare a baby's food without, sooner or later, making some mistake, often a serious one. If complicated mixtures are needed, they often can be made only in a laboratory. Laboratory milk necessarily costs more than milk made at home, because at home a mother does the work herself, has no capital invested, and does not make any profit, as the laboratory must.

Modified milk can be prepared satisfactorily in the home, provided the milk supply is satisfactory and the person who prepares it is willing to take sufficient time

and to be sufficiently careful. The modifications obtained are not as accurate, because the milk supply is usually not as constant and there is more opportunity for mistakes in calculation. Fortunately, however, the average baby does not notice small variations in its food. Such variations, therefore, usually do no harm. As a matter of fact, they are likely to be less than the variations in breast milk from day to day and feeding to feeding. Most babies will, of course, be fed on home modified milk, because there are laboratories in only a few of the large cities. The express charges make its use elsewhere almost prohibitive and many people, even in the cities, are unable to bear the expense of laboratory milk or prefer to make the milk themselves.

Chapter VIII

THE HOME MODIFICATION OF MILK

APPARATUS REQUIRED FOR THE HOME MODIFICATION OF MILK

THE following articles are required for the home modification of milk:

One Dozen Nursing Bottles.—The 4-ounce size for babies less than three months old, and the 8-ounce size for older babies. The best bottles are made by the Walker-Gordon Laboratory Company. Those made by The Whitall-Tatum Company are satisfactory. We do not approve of the Hygeia bottles. While they are easy to clean, they cannot be easily stoppered, and the milk has to be kept in another bottle and poured into the Hygeia bottle at the time of feeding. Furthermore, they are so large around that the milk cools in them very quickly.

Cream dipper.

Graduate, measuring ounces. An 8-ounce graduate is preferable.

Cotton for Stoppers.—This cotton should be non-absorbent. It may be procured bleached, but the ordinary wadding is satisfactory.

Brush to clean bottles.

A large dish or pail in which to boil the bottles and utensils.

Glass pitcher in which to mix the food. A 2-quart pitcher is desirable.

Tablespoon or a glass graduated spoon.

Thermometer, if the milk is to be pasteurized. The Walker-Gordon Laboratory has a special thermometer for this purpose, but any thermometer which registers as high as 150° F. will do.

Clean towel.

The nursing bottles should be rinsed out with cold water as soon as they are used and kept full of water. They should always be boiled before the food is put in them. It is also advisable to boil the other utensils; at any rate, they should at least be washed and scrubbed. It goes without saying that the hands of the person preparing the mixture must be washed and that scrupulous cleanliness must be used in every way in the preparation of the food. When and where it is prepared must depend on the circumstances in the individual family. In general, it is wiser to prepare it in the morning. In the city milk delivered in the morning has usually been milked long enough before, so that the cream has risen and the food may be prepared as soon as desired. In the country, if it is desired to prepare the food in the morning, it is better to use the night's milk. The milk should be set in bottles, not in pans.

MATERIALS USED IN THE HOME MODIFICATION OF MILK AND THE METHOD OF PREPARATION

We have found it more convenient and more satisfactory to use gravity cream and skimmed milk in the home modification of milk than other strengths of cream or top milk and hence shall describe only this method. Milk mixtures may be prepared equally well, however, with various strengths of top milk instead of gravity cream or with whole milk in place of skimmed milk, if ordered by the physician. The method of preparation is in general the same.

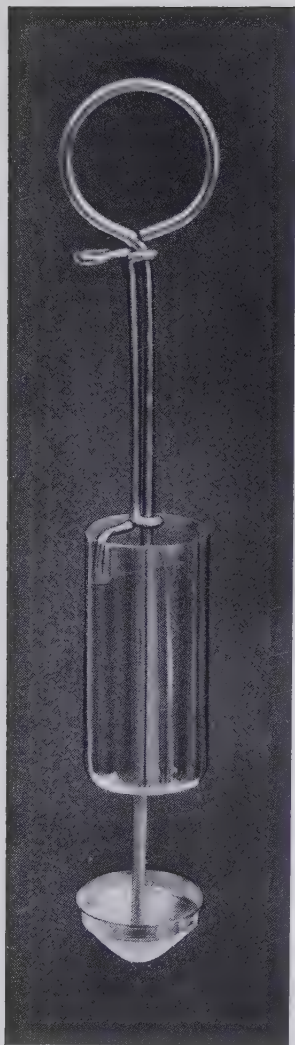


FIG. 9.—CHAPIN CREAM DIPPER.
(Courtesy of Jordan Marsh Co.)

Gravity cream is all of the cream which is visible on milk which has set for six hours or longer. On the average it contains 16 per cent. of fat, but, if the milk contains much more or much less than 4 per cent. of fat, the cream will likewise contain a higher or lower percentage of fat. The best way to obtain gravity cream is to remove it with a Chapin cream dipper. There are two sorts of Chapin dippers, one with a solid bottom, and the other with a bottom which opens. The one with the open bottom is preferable. If the one with the solid bottom is used, a dipperful of cream must be removed with a spoon before the dipper is introduced. If it is not, the cream will run over. If necessary, the cream may be poured off. It is almost impossible, however, to pour off the cream without pouring some of the milk with it. The cream is, therefore, not as strong as it is supposed to be. There are usually 6 or 7 ounces of gravity cream on a quart of milk. If there is not enough cream on 1 quart, all the cream must be taken from 2 quarts and mixed together, the required number of ounces then being taken from this mixed cream. It is not right to take all the cream from one bottle and then the 2 or 3 top ounces from the other, because the top ounce contains more fat than the next one, and so on, so that the cream taken in this way would be too rich. The top of the bottle must be carefully cleaned before the cap is removed.

Skimmed milk is the milk that is left after the gravity cream has been removed. It really contains from 1 to 1.50 per cent. of fat, but, for convenience, it is usually considered to contain no fat. If the lowest part of the milk in the bottle is used, it will contain less than does the whole of the skimmed milk.

"Fat-free" milk, which contains less than 0.25 per cent. of fat, can be obtained with the separator, and may be used in special instances where there is a marked intolerance for fat.

Sugar.—There are various kinds of sugars: *milk-sugar*, *cane-sugar*, the *maltose-dextrins preparations*, *maltose*, and so on, all of which are sometimes used in the preparation of modified milk. Sugar is not measured in a graduate, because an ounce by measure is not the same as an ounce by weight. It may be weighed, if desired, but this is not necessary, as a rounded tablespoonful of all the sugars, except cane-sugar, weighs about $\frac{1}{2}$ ounce and a level tablespoonful about $\frac{1}{3}$ ounce. The difference in the weights of the other kinds of sugar is so slight that it can be disregarded. A level tablespoonful of cane-sugar weighs about the same as a rounded tablespoonful of the other sugars.

Boiled Water.—These are the materials which are used in the preparation of the ordinary routine mixtures.

The sugar is dissolved in the water in the pitcher, preferably while the water is still hot. If the mixture is to be used raw, the water is allowed to cool to body temperature, about 100° F., after which the gravity cream and the skimmed milk are added. The reason that the water is allowed to cool is that, if the cream and milk are added when it is hot, they will be partially pasteurized. If the mixture is to be pasteurized or boiled, they may be added to the water while it is still hot. The proper amount of the mixture is then poured into each bottle. The top of the bottle should be wiped before and after the milk is poured in. The bottles are then stoppered tightly and are put on the ice and kept there until used.

Cereal Diluents.—Cereal waters, prepared from vari-

ous flours, are, in many instances, used in place of water. The physician should specify how strong they are to be made. If he does not specify, use 2 rounded teaspoonfuls of flour to a pint of water. Cereal water, made in this way, contains about 1.50 per cent. of starch. The barley flours which are most used are Robinson's Patent Barley; Brooks' Baby Barley, and Mead, Johnson & Company's barley flour, but any good barley flour will do. The oat flours most commonly used are Robinson's Groats and that of Mead, Johnson & Co. It is safe to make enough cereal water to last for two days. It mixes better with the milk and cream if it is warm. It will, however, if hot, overheat the milk.

Whey is the watery part of the milk which is left after the curds formed, when liquid rennet, essence of pepsin or junket tablets are added to warm milk, have been strained out. It contains milk-sugar, soluble protein, and salts. It is sometimes used when babies do not digest casein easily or when they vomit. Whey must be heated to 150° F. at some time before it is mixed with cream or milk, in order to destroy the rennin ferment which has been added in its preparation. Otherwise it will curdle the cream or milk. The whey should be cooled to 100° F. or lower before it is added to the milk and cream.

Lime-water is often used in milk mixtures to delay the action of the rennin ferment of the stomach and to thus prevent the formation of large casein curds. If the mixture is to be boiled, the lime-water should not be added until after it has been boiled and cooled, because boiling prevents the desired action of the lime-water. Pasteurization, however, does not interfere with it.

Chapter IX

THE DETAILS OF ARTIFICIAL FEEDING IN THE FIRST YEAR

STRENGTH OF FOOD AT DIFFERENT AGES

ONE of the fundamental principles of artificial infant feeding is that babies cannot be satisfactorily fed in a routine way and the composition of the food must be varied to suit the needs of the individual infant. Nevertheless, there is no doubt that young babies should have a weaker food than older babies, that the strength of the food should be gradually increased as the baby grows older, and that the food should be gradually changed from modified milk to whole milk as soon as the baby's digestion is able to take care of it. This is usually somewhere between the ages of nine and twelve months.

Another one of the fundamental principles of artificial feeding is that the food should be prescribed by a competent physician and that the mother and nurse should have nothing to do with the determination of its composition. Their part is to prepare the food, give it to the baby, and report to the physician. We realize, however, that mothers are sometimes unable to obtain a physician and that emergencies sometimes arise when it is necessary to give the baby some food at once. Experience shows that, on the average, well babies of a given age will usually be taking about the same strength of food. It is possible, therefore, to construct a table which will temporarily meet the needs of well babies.

We have drawn up such a table to help mothers who are unable to get a physician and for use in emergencies. It should not be used except under these conditions.

TABLE II

Age.	Gravity cream, ounces.	Skimmed milk, ounces.	Water, ounces.	Milk-sugar, tablespoonfuls.
First food.....	1	1	14	1 rounded and 1 level
1 week.....	2	1½	12½	1 rounded and 1 level
1 month.....	3	2	11	1 rounded and 1 level
2 months.....	3½	3½	9	1 rounded and 1 level
4 months.....	3½	5	7½	2 level
6 months.....	3½	7½	5	2 level
8 months.....	3½	9	3½	1 rounded
9 months.....	Whole milk,	12½	3½	1 rounded

The quantities of the various ingredients given in the table in each instance make a 16-ounce formula. If a larger quantity is needed, use two or three times as much of each ingredient, making formulas of 32 and 48 ounces.

It is safe to substitute one of the cereal waters for water at any time after the baby is four months old.

Intervals Between Feedings.—There is much difference of opinion as to the proper intervals between feedings. We feel that the length of the intervals cannot be so important as some people suppose, because, if it was, so many babies would not do so well on all of them. In general, the intervals should be shorter for young than older babies. People forget that the intervals must vary not only with the age of the baby but also with the strength and gastric capacity of the individual infant, the strength and composition of the food, and the amount taken at a feeding. It seems self-evident that a baby that has had a large meal of strong food will not need another feeding as soon as one that has had a small

meal of weak food. Fats leave the stomach slowly; carbohydrates leave it quickly. Therefore, the interval after a feeding rich in fat should be longer than that after a feeding rich in carbohydrates. The important thing is regularity in feeding, and that, when a schedule is adopted it is closely followed. Breast-fed babies usually do well, even if they are not fed regularly. Artificially fed babies are quite likely to be upset if they are not fed at regular intervals. While advisable, in order to keep up good habits, it is not necessary, however, to feed them exactly on the minute. A variation of a few minutes one way or the other is not harmful, and will not make the baby ill. The intervals between the feedings are, in general, the same as in the breast fed. They must be varied, however, to suit the conditions in the individual instance.

The Amount of Food in Twenty-four Hours.—The amount of food given in twenty-four hours must naturally depend on the strength of the food and the needs of the individual infant. Some babies require more food than others. If the food is strong, a smaller amount will be needed than if it is weak. Experience shows that the amount of food taken in twenty-four hours increases rapidly during the first three months and less rapidly during the remainder of the year. The average baby takes from 10 to 12 ounces when it is a week old; 20 ounces at the end of the month; 32 ounces when four months old; 36 to 40 ounces at six months; 48 ounces at nine months.

The Amount of Food at a Single Feeding.—The amount of food to be given in twenty-four hours is far more important than the amount to be given at a single feeding. When the amount to be given in twenty-four hours is determined, the amount to be given at a single feeding

will naturally depend on the intervals between the feedings. The longer the intervals, the larger the amount at feeding, and vice versa. In a general way, however, the average baby takes about $\frac{1}{2}$ ounce at a feeding in the first few days, and from 1 to $1\frac{1}{2}$ ounces when it is a week or ten days old. It takes about $2\frac{1}{2}$ ounces when it is a month old; 4 ounces at three months; 6 ounces at six months; and 8 ounces at nine months. It seems evident, but is nevertheless sometimes forgotten, that when the number of feedings is reduced by lengthening the interval between feedings, the amount of food at each feeding must be increased enough to make up for the feeding which was omitted.

While it is impossible to lay down any absolute rules as to the intervals between feedings and the amount to be given at a feeding at different ages, nevertheless, experience shows that the average baby usually takes about so much food at a feeding at a given age. We have, therefore, constructed a table showing the amounts of food which the average well baby of a given age may be expected to take at given intervals. The table on page 82 is intended to serve merely as a guide, and must not be followed slavishly.

When there are ten feedings at two-hour intervals these feedings are given every two hours from 6 A. M. to 10 P. M. and once between 10 P. M. and 6 A. M. Eight feedings at two-and-a-half-hour intervals are given every two and a half hours from 6 A. M. to 9 P. M., and once in the night. The 9 P. M. feeding may be given, if desired, at 10 P. M. Seven feedings at three-hour intervals are given every three hours from 6 A. M. to 9 or 10 P. M. and once in the night. Six feedings at three-hour intervals are given every three hours from 6 A. M. to 9 or 10 P. M. When there are five feedings at three-

TABLE III¹

INTERVALS AND AMOUNTS OF FOOD FOR AVERAGE WELL BABIES		
Age.	Twenty-four-hour amount, ounces.	Number of feedings, amount and intervals.
1 week.....	10 to 12	10 feedings of 1 ounce at two-hour intervals.
		8 feedings of 1½ ounces at two-and-a-half-hour intervals.
1 month.....	20	8 feedings of 2½ ounces at two-and-a-half-hour intervals.
		7 feedings of 3 ounces at three-hour intervals.
3 months.....	28	7 feedings of 4 ounces at three-hour intervals.
		6 feedings of 6 or 6½ ounces at three-hour intervals.
6 months.....	36 to 40	5 feedings of 7 or 8 ounces at three-hour intervals.
		5 feedings of 7 or 8 ounces at four-hour intervals.
		6 feedings of 8 ounces at three-hour intervals.
9 months.....	48	5 feedings of 9½ ounces at four-hour intervals.

hour intervals the 9 or 10 P. M. feeding is omitted. When there are five feedings at four-hour intervals they are given every four hours from 6 A. M. to 10 P. M. It is not necessary to begin to give the feedings at 6 A. M.; 7 A. M. will do as well, but the time must then all be moved along one hour.

Method of Feeding.—When it is time to feed the baby the bottle of milk is placed in a dish of either cool or warm, but never hot, water with the cotton still in the bottle. Any convenient receptacle and any form of

¹ From Morse and Talbot's Diseases of Nutrition and Infant Feeding, The Macmillan Company, Publishers.

heat may be used. It is heated until the milk reaches blood heat or 100° F. The only way in which the temperature of the milk can be accurately determined is by a thermometer. In most instances, however, this is not necessary, and it may be determined by shaking a drop of milk on the back of the hand or arm. The mother or nurse should never taste the milk to find out if it is warm enough. The cotton stopper must be removed and the top of the bottle wiped before the nipple is put on.

The baby should not be picked up to be fed. It may be fed while lying on either its back or side; the back is usually preferable. The bottle must be held during the whole feeding. It should never be propped up and left. Except in very warm weather it is wise to cover the bottle with a cozy to prevent the cooling of the milk. If the baby takes its food in the proper length of time, it is usually not necessary to rewarm it.

The normal baby takes its food, on the average, in from fifteen to twenty minutes. It is not abnormal, however, if the food is taken in ten minutes. Some babies need a little more than twenty minutes. If less than ten minutes is taken, it means that the baby is very vigorous, that there is not enough food, or that the hole in the nipple is too large. If there is evidently enough food and the baby wishes to take it in less than ten minutes, the hole in the nipple should be made smaller or, better, the bottle should be taken out of its mouth and it should be made to wait. If more than twenty minutes is taken, it means that there is too much food, that the hole in the nipple is too small, that the baby is not hungry, or that it is feeble or ill.

If a baby has gas and is in the habit of spitting up after nursing, it is often advisable to pick it up every minute or two during the feeding and pat its back, so

that it may raise the gas. If it swallows air while nursing and vomits, a different nipple should be tried and the baby should be picked up frequently. In general, however, a baby should be let alone after the feeding unless, perhaps, it is given a swallow of water. It is much less likely to spit up or vomit after a feeding if it is not stirred up. If a baby does not take all of a feeding, the remainder should be thrown away. It should never be warmed up later and given again. The bottle should be rinsed with cold water and put away full of cold water.

Nipples.—There is no perfectly satisfactory nipple, and, unfortunately, there probably never will be one. It is impossible for a baby to suck on a bottle without making a vacuum, which collapses a soft nipple. If the nipple is hard and will not collapse, it is usually very difficult to clean. When the nipple collapses the edge should be separated from the bottle enough to allow air to enter.

The most satisfactory nipples are the so-called glove-finger nipples which can be turned inside out and washed. No nipple is satisfactory that cannot be turned inside out and washed. The nipples without holes are more satisfactory than the others. The hole can then be made of the desired size with a red-hot cambric needle. The size of the hole must necessarily depend somewhat on the strength and composition of the food. Whatever size it is, it will grow bigger, and the more carefully the nipple is cleaned and boiled, the faster it will grow. The nipple should be taken off of the bottle as soon as the feeding is finished, turned inside out, and washed with cold water. It should then be kept either in water or in a 4 per cent. solution of boric acid. Nipples should always be boiled once daily; better, each time, just before they are used.

Water.—It is advisable to give a baby from one-half to as much water daily between feedings as it takes of food at one feeding. It should be given at room temperature from a spoon or bottle. It should be boiled during the first year. More is needed in hot than in cold weather.

THE DIFFERENT FOOD ELEMENTS

While it is the province of the physician to decide just how much of the various food elements should be in a baby's food, and what form they should be in, nevertheless, it is advisable for a mother to know something as to the value and action of these elements, so that she will not be so easily disturbed and led astray by those who know less.

Fat has more than twice the caloric or nutritive value of the other food elements—9.3 to 4.1. Its principal use is as a fuel, but a small amount of it is necessary to supply the fat-soluble A vitamin. Carbohydrates and fat may be used interchangeably as fuel. The only practicable fat for babies is that of milk. Olive oil may sometimes be used temporarily, but too much of it is laxative, and it is deficient in vitamin A. Cod-liver oil, while an antirachitic, cannot be given in large enough amounts to aid much in nutrition without upsetting the digestion. The common tendency of mothers and nurses is to give too much fat in the hope of fattening their babies or of loosening their bowels. As a matter of fact, fat to a certain point is laxative; beyond that, it is constipating. Babies that get indigestion from an excess of fat do not gain. Babies are also often given too much fat because physicians, nurses, and mothers do not understand about the fat content of different sorts of creams and top milks or are careless in the preparation of the food.

Sugars are of value only as fuel and as regulators of the fermentative processes in the intestines. They contain no vitamins. There are a number of different sugars used in infant feeding. They all have the same nutritive value.

Milk-sugar (lactose) is the most suitable one for well babies because it is the form of sugar present in human milk and in that of all animals, and because it is the one best fitted for the maintenance of the normal bacterial flora in the baby's bowels. The tolerance of the normal baby for the different forms of sugar is so great, however, that it can usually thrive on any of them.

Cane-sugar (saccharose), or ordinary table sugar, may be used in place of milk-sugar. Its only advantage lies in its lower price. It will always disagree if milk-sugar does, and may when milk-sugar does not.

Maltose is never used in its pure form, but always in combination with the dextrans, which are steps in the chemical change from starch to maltose. The preparations containing the largest proportion of maltose are liquid and very laxative. The others are in the form of powders and contain various proportions of maltose and the dextrans. Examples of these sugars are the various forms of Mead's Dextrin-maltose and Mellin's Food, which, except for a small percentage of an added salt, are composed entirely of maltose and the dextrans. They are more or less laxative, according to the larger or smaller proportion of maltose which they contain. They ferment in a different way from milk-sugar and cane-sugar in the baby's intestines, and are often useful when there is a disturbance of the digestion of these sugars. They may themselves, however, cause indigestion and fermentation, which will be relieved by milk-sugar.

Starches.—The starches have the same food and

nutritive value as the sugars and are all changed to sugar in the intestines before they are absorbed. They ferment more slowly than the sugars, and can, therefore, sometimes be given when sugars cannot. They are given in the form of the cereal waters. The food value of these cereal waters is, however, very slight. That of a pint of one of them is less than that of a level tablespoonful of any kind of sugar. It is evident, therefore, that if babies thrive on foods made up with the cereal waters, it is not because of the cereal water, but because of the milk and other things in the food. The starch in these waters does, however, interfere with the formation of large casein curds, and in this way they sometimes make the digestion of the milk easier.

It was supposed for a long time that young babies could not digest starch. We know now, however, that babies are able from birth to digest the amount of starch in the cereal waters. While this is true, there is, nevertheless, no starch in human milk. It is probably not advisable, therefore, to give starch to little babies unless there is some special reason for it. Furthermore, an excessive amount of starch may cause serious indigestion.

There is no difference in the power of different forms of starch to hinder the formation of large casein curds. Some babies can digest one form of starch, however, while they are made sick by others. There is no evident reason for this idiosyncrasy. Oat starch is usually considered to be more laxative than barley starch. This is probably true as a general rule, but barley is more laxative than oats for some babies.

Protein is the only food element from which new tissues can be formed and which can replace the tissue waste of the body. It is, therefore, essential for the

maintenance of life and for growth. It may serve as a source of heat, but its use in this way is wasteful, as more energy is used up in its utilization than in fat and carbohydrates, and the elimination of its end-products throws an unnecessary strain on the kidneys. The most available form of protein for infants is that of milk. It is impossible to give a baby enough vegetable protein to supply its needs without upsetting its digestion, and, moreover, vegetable protein cannot entirely replace animal protein in the food at any age. It is also impossible to give a baby sufficient animal protein, in the form of eggs, meat or meat juices, without making it sick.

The protein of cow's milk is less digestible than that of human milk because of the larger proportions of casein which it contains. Casein, when it is coagulated by rennin in the stomach, forms large, tough curds. Many infants find it difficult to digest these large curds and are consequently disturbed by them. This being the case, it is often advisable to prevent the formation of these curds. There are many ways of doing this, which, while they seem very unlike, really accomplish the same purpose. One method seems to work better in one instance, however, and another in another. These methods of preventing the formation of large casein curds are:

THE PREVENTION OF LARGE CASEIN CURDS

Dilution of the Milk.—The simplest way to prevent the formation of large curds is by diminishing the amount of casein in the milk by diluting it. If the milk is diluted too much, however, the chances are that the protein will be so much diminished that the baby will not get enough of it.

Whey Mixtures.—Another way of preventing the formation of these curds is by giving most of the protein in the form of whey from which the casein has already been removed. This is the chief reason for using whey mixtures.

Cereal Waters.—The starch in the cereal waters mechanically interferes with the formation of the large curds.

Boiling.—Boiling milk causes some chemical change in the casein which prevents the formation of large curds by rennin, the curd formed by rennin in boiled milk being soft and fine. The milk must be boiled, however, at least five minutes in a saucepan. Heating in a double boiler is not sufficient.

Lime-water and Bicarbonate of Soda.—These alkalis prevent or hinder the formation of large casein curds by delaying the action of rennin. Considerable amounts of the alkali must be added, however, to do any good. The amount to be added must, moreover, be calculated in relation to the amount of milk and cream in the mixture, not in relation to the total amount of the mixture. At least one-quarter as much lime-water as milk and cream must be added to have any appreciable effect, and one-half as much lime-water as milk and cream to have any marked effect; $1\frac{1}{2}$ grains of bicarbonate of soda have about the same effect as 1 ounce of lime-water. Boiling the mixture prevents this action by the lime-water, but not that of bicarbonate of soda.

Citrate of soda, by a special chemical action changes the composition of the casein in the milk so that fine curds are formed in it by rennin; 1 or 2 grains to the ounce of milk and cream in the mixture is necessary.

Peptonization.—When the milk is peptonized the casein is partially predigested, so that large curds cannot be formed by rennin.

Buttermilk.—When buttermilk is made by churning, the formation of large casein curds is mechanically prevented. Furthermore, in the ripening of the milk, some chemical change occurs which prevents the formation of large curds. Buttermilk, however, is ordinarily not used especially on this account, but for the action of the bacteria which it contains in the treatment of certain forms of indigestion.

Eiweissmilch or, in English, Protein or Albumin Milk.—In this milk the casein has already been coagulated by rennin and the curds have been mechanically broken up by being forced through a sieve. Large curds cannot, therefore, be formed in the stomach. This preparation of milk, like buttermilk, however, is more often used in the treatment of certain forms of indigestion rather than because of the finely divided form of the casein.

Chapter X

THE PROPRIETARY AND PATENT FOODS

IT must be remembered in considering the proprietary and patent foods that they can contain only certain food elements, namely, fat, carbohydrates, protein, and salts. No proprietary food can contain anything which will serve as a food except these elements. If it has any value as a food it must be because it contains one or more of these elements. All of these elements except starch are present in milk, and starch can be easily obtained from any of the cereals. Therefore, it is very easy to make a modified milk which will contain everything which is in any of the proprietary foods. One of the advantages in modified milk mixtures over the proprietary foods is that the relations of the food elements can be changed to fit the needs of the individual infant, while in the proprietary foods the relations of these elements must necessarily remain unchanged. All that can be done is to change the amount of these elements by more or less dilution of the food. Another advantage of modified milk over the proprietary foods is that it is less expensive. No one makes a profit on modified milk unless it is prepared at a laboratory. The cost of the proprietary foods, however, includes not only the cost of the materials of which they are made, but the cost of manufacture and advertising of the food, as well as the profit of the manufacturer and one or more middlemen.

Many babies undoubtedly do well on the proprietary foods. The tolerance of many of these babies is so great, however, that they would do well on any food in any

way reasonable. Others do well because the proprietary food happens to contain the combination of the food elements suitable for them. They would do equally well on the same combination of elements in modified milk.

The proprietary and patent foods can be divided into four main groups: (a) condensed milk; (b) the malted foods; (c) the sugar and starch foods; (d) the starch foods.

Condensed Milk.—The condensed milks usually contain a somewhat smaller proportion of fat than the original milk from which they were made. Otherwise the relations of the food elements are the same as in whole milk, unless, as is the case in many brands, a considerable amount of cane-sugar has been added. These relations cannot be changed by dilution. In most instances the dilutions used are so great that the mixture is much weaker than whole milk. They often agree on this account. The cane-sugar which many of them contain increases their nutritive value, but the excess of sugar causes them to disagree with many babies. The casein is more easily digested than that in raw milk. The antiscorbutic vitamin is destroyed during the process of manufacture.

The Malted Foods.—The best known of the malted foods are Mellin's Food and the various forms of Mead's Dextri-maltose. Mellin's food contains 0.16 per cent. of fat, 79.57 per cent. of sugar, and 10.35 per cent. of protein. The sugar is 58.88 per cent. malt sugar and 20.69 per cent. dextrins. If this food is given mixed with water it simply amounts to a sugar solution with a small amount of protein. When given with milk the mixture amounts to a modified milk with the sugar in the form of maltose and the dextrins. Mead's Dextri-maltose Number 1 contains no fat or protein, but 52 per cent. of malt-sugar and 41 per cent. of the dextrins. The other dextri-

maltose preparations are similar, that is, when mixed with water they make simply a sugar solution and, when mixed with milk, they give a modified milk with the sugar in the form of maltose and the dextrins.

The Sugar and Starch Foods.—The best known example of the sugar and starch foods is Eskay's Albuminized Food. This contains 3.52 per cent. of fat, 54.12 per cent. of milk-sugar, 1.70 per cent. of dextrins, 6.70 per cent. of protein, and 29.90 per cent. of starch. If this food is mixed with water the mixture will contain but little fat or protein, and will amount to a sugar and starch solution. If it is mixed with milk the mixture corresponds to a modified milk prepared with one of cereal diluents.

The Starch Foods.—Imperial Granum is the best known of the starch foods. A comparison of the analyses of Imperial Granum and wheat flour is of interest. Imperial Granum contains 1.04 per cent. of fat and wheat flour, 1 per cent. of fat. Imperial Granum contains 14 per cent. of protein; wheat flour, 11.40 per cent. of protein. Imperial Granum contains 73.54 per cent. of starch; wheat flour, 75.10 per cent. of starch. Imperial Granum contains 0.42 of dextrose and 1.38 per cent. of dextrins. When these percentages are added to the percentage of starch in the mixture the sum is 75.34 per cent., almost exactly the same percentage as that of the starch in flour. When it is remembered that when starch is heated a small percentage of it is changed into dextrins and dextrose, it seems probable that Imperial Granum is simply wheat flour which has been baked. It would seem cheaper and equally efficacious to buy wheat flour if it seems advisable to add starch to a milk mixture.

Dry milk has been used for many years in a number of proprietary foods, such as Nestlé's, Allenbury's, Mammala, and Malted Milk, in combination in them, of

course, with other things. Recently dry milk without any additions has been used in infant feeding. The Dryco brand is made from partly skimmed milk. Klim whole dry milk is made from whole milk, and Klim skimmed dry milk is made from milk which is almost fat free. It is evident that when these preparations are mixed with the proper amount of water they will contain the food elements of milk in the same proportions that they were in the original milk, that is, the relations of the fat, sugar, and protein in the dilutions of Klim whole dry milk will be the same as in whole milk. The percentage of fat will be relatively low in the dilutions of Dryco, and there will be practically no fat in the dilutions of the Klim skimmed dry milk. These dilutions will naturally agree or disagree with individual babies in the same way as would dilutions of whole, partly skimmed, or skimmed milk. These dry milks cannot be changed in any way to give any different relations in the percentages of the different food elements to fit different babies. The casein in these dry milks is, however, broken up during the process of drying so that it is not coagulated into large curds by rennin, and hence is more easily digested than the casein of fresh milk. The casein is no more easily digestible, however, than it is when it is changed in the other ways which have been mentioned. The antiscorbutic vitamin is weakened to a certain extent. There is, therefore, no advantage in using dry milk instead of fresh milk, except when a suitable fresh milk cannot be obtained or when it is impossible to properly take care of fresh milk, if it can be obtained. Under these conditions dry milk is most useful. It is very useful while traveling, and in many countries, like China, Porto Rico, and South America, it is the only form of milk which it is safe to use.

Chapter XI

FEEDING IN THE LATTER PART OF THE FIRST YEAR

BREAST-FED babies have usually been weaned by the time they are nine or ten months old, and are taking whole cow's milk, with or without the addition of one of the cereal waters. The method of feeding them during the latter months of the first year is, therefore, the same as when babies have been artificially fed. When the baby is nursed until the end of the first year it is usually advisable not to give it anything in addition but cows' milk in some form before it is eleven months old.

Orange Juice.—When a baby is artificially fed, it is advisable, if the milk is pasteurized or boiled continuously, to begin to give it orange juice when it is about three months old in order to prevent the development of scurvy. It is customary to begin to give orange juice, even if the milk is given raw, when babies are about six months old. This is unnecessary, however, because scurvy almost never develops if the milk is given raw. On the other hand, it does no harm and should be given if the baby is constipated. One tablespoonful of orange juice daily is usually sufficient and 2 tablespoonfuls always sufficient to prevent the development of scurvy. Orange juice should be given an hour before some feeding, when the stomach is approximately empty, in order not to interfere with the digestion of the milk. It may be given either plain or diluted with water. There is no

objection to adding a little granulated sugar to it if it is very sour.

Cereals.—When babies are artificially-fed it is advisable, if they are digesting their milk well, to begin to give one of the simple cereals when they are about nine months old. It may sometimes be given earlier. It should be given at the beginning of two feedings daily, at 9 A. M. and 6 P. M., if the baby is on three-hour intervals, and at the beginning of the 10 A. M. and 6 P. M. feedings if it is on four-hour intervals. The most easily digestible cereals are strained oatmeal, barley jelly, and farina. A level tablespoonful is enough to give at first. This may be gradually increased to 2 rounded tablespoonfuls by the end of the year. The cereal should have some of the baby's mixture on it, with a little salt, but no sugar. It should be given to the baby with a spoon, not mixed with the food in the bottle. Cream of Wheat may be added to the list of cereals after one or two months.

Beef Juice and Broths.—It is also advisable, within a few weeks after beginning the cereals, to give beef juice, or mutton or chicken broth, at the beginning of the 12 M. feeding, if the baby is on three-hour time or of the 2 P. M. feeding, if it is on four-hour time. The beef juice obtained by half broiling steak, cutting it up into small pieces, and squeezing out the juice should be used. Dish gravy is not the same thing as beef juice. It contains a considerable amount of cooked fat and is quite indigestible unless cooled and skimmed. The various beef extracts and liquid preparations of beef juice on the market should never be used, as they contain but little nourishment, while the liquid preparations contain an appreciable amount of alcohol. One teaspoonful of beef juice is sufficient in the beginning. This may be in-

creased to 2 tablespoonfuls, or 1 ounce, if it does not disagree with the baby. It may be given plain or diluted with water, and should be salted to taste. Beef juice sometimes makes babies nervous and sleepless. Two ounces of mutton or chicken broth is enough to give at first, and this may be increased to 4 ounces. The broths, however, have practically no nutritive value, and that of beef juice is only one-half that of an equal amount of milk. It is unwise, therefore, to fill a baby up with broth and thereby prevent it from taking its milk. The chief value of broth is as a vehicle for other foods.

Zwieback, Bread Crumbs, Rice, and Macaroni.—When the baby is ten or eleven months old zwieback and bread crumbs may be added to the beef juice and broth, and, a little later, boiled rice and plain boiled macaroni which has been put through a ricer.

Bread and Crackers.—If the baby has a sufficient number of teeth it may also be given zwieback, thoroughly stale bread, or plain white crackers “in its hand” to eat after one or two feedings daily. They should not be given between meals. The best crackers are Uneeda Biscuits, or other similar crackers, and Pilot Wafers. Graham crackers should not be given, as they are too sweet and are not as easily digested.

Junket, Baked Apple, Apple Sauce, and Prune Juice.—There is no objection to giving the whole or part of the milk at the midday feeding in the form of junket. If the baby is constipated a little baked apple, apple sauce, or prune juice may be given with the midday meal. Baked apple is for some reason more easily digested than apple sauce.

Chapter XII

INDIGESTION IN THE ARTIFICIALLY-FED IN THE FIRST YEAR

INDIGESTION in the artificially-fed in the first year is almost always due to an excess of one or more of the individual food elements in the food. A deficiency of one or more of the food elements causes malnutrition, not indigestion. Indigestion may also be due to an excessive amount of a food otherwise suitable. It may also be due to causes not connected with the food, which weaken the powers of digestion. Such causes are other diseases, interference with the breathing, as from adenoids, and chronic infections of various sorts. Extremes of temperature, whether of heat or cold, exposure, over-fatigue, and excitement are among other causes. A baby that is insufficiently clothed, that is constantly played with and handled, that does not get sufficient sleep because of noise or excitement, cannot digest as well as a baby that is warm and quiet and has plenty of sleep. In such cases the indigestion will continue, no matter how much the food is changed. So it will, if the indigestion is secondary to other diseases, adenoids, or infections, unless these conditions are cured or removed.

Indigestion from an Excess of Food.—When indigestion is due to an excess of food there is almost always vomiting. If the vomiting occurs immediately or soon after taking the food the appearance of the vomitus will be like that of the food. If it occurs later the vom-

itus will be more or less acid and the food partially digested. If there is much vomiting there is usually not much loss of appetite. Otherwise, there is. There is usually considerable gas and an increased number of stools. These are loose and not characteristic. They show a combination of the abnormalities due to the individual food elements, which will be detailed below. There is usually failure to gain in, or loss of, weight.

The general principle of the treatment is to diminish the amount of food or to weaken it.

Indigestion from an Excess of Fat.—When the indigestion is due to an excess of fat in the food the baby is likely to lose its appetite and often vomits. The vomitus has a strongly acid or rancid odor. The baby usually does not have much colic. The stools may be either loose and increased in number or constipated. If they are loose they are light yellow and sometimes have an oily appearance. They have an acid odor, are acid in reaction, and often irritate the buttocks. They very frequently contain small curds. These curds are never larger than a split pea, are white or light yellow in color, are easily flattened out by pressure, and will float in water. There is sometimes mucus in the stools. If the stools are constipated they are dry and sometimes crumbly. The color varies from light yellow, through gray, to white. They are almost always smooth, are alkaline, and do not contain any curds or mucus. There is failure to gain in, and finally loss of, weight. Indigestion from an excess of fat is more likely to be chronic than acute. It is more likely to be very serious than the other types, and, if it has become severe, it is very hard to correct. It is seldom associated with fever. The general principle to be followed in the treatment is to diminish the fat in the food, at the same time increasing the other ele-

ments. In severe cases the fat has to be cut out of the diet entirely.

Indigestion from an Excess of Sugar.—Indigestion from an excess of sugar is more likely to be acute than chronic. There is usually some loss of appetite. Vomiting is common. The vomitus is acid. There is usually a large amount of gas and frequently much colic. The stools are loose and increased in number. They may be yellow. If the sugar which the baby has been taking is milk sugar or cane sugar, they are usually various shades of green. If it is one of the maltose-dextrins combinations, they are yellowish brown or brownish. They are very strongly acid, have an acid odor, and are very irritating to the skin. They often contain mucus. They may contain small curds as the result of the hurrying of the undigested fat through the bowels. In the acute cases there may be high fever and rapid loss of weight. In the chronic cases there is little or no fever, and the loss of weight is less marked. The outlook in chronic cases of indigestion from an excess of sugar is good. Babies may die, however, from severe acute indigestion.

The general principle of the treatment in the acute cases is to cut out the sugar and fat from the food, as far as possible, and to give proteins. In the chronic cases the sugar is cut down or another form of sugar is substituted for it. The fat is usually also cut down and the protein increased. Starch may sometimes be given in place of some of the sugar.

Indigestion from an Excess of Starch.—The symptoms of indigestion from an excess of starch are essentially the same as those from an excess of sugar, except that they are seldom very acute and, as a rule, not very severe, presumably because the excess of starch is seldom so great as is the excess of sugar. In certain instances,

however, when babies have been fed almost exclusively on the starch foods for a long time, the disturbance of nutrition is very marked. They often become very pale and are sometimes bloated from an excess of water in the tissues.

The general principle of treatment is to cut the starch out of the food, making up for it by increasing the fat and protein, especially the protein. It is also advisable to cut down or cut out the sugar. Later on the fat may be increased and sugar added.

Indigestion from an Excess of Protein.—Indigestion from an excess of protein is not as common as indigestion from an excess of one of the other food elements. Its symptoms are harder to recognize and describe. There is usually not much loss of appetite. Vomiting is not uncommon. The vomitus usually contains a large amount of curdled milk, the curds often being large and tough. There is often considerable gas and not infrequently much colic. In the milder cases the stools show nothing abnormal except the presence of large casein curds. These curds vary in size from that of a split pea to a dressed olive. They are white in color, cannot be flattened out by pressure, and, when put in water, sink. In other cases the stools are loose, yellowish brown, have a foul odor, are alkaline in reaction, and contain mucus. They usually do not irritate the buttocks. In the severest cases the stools are frequent, small, loose, brownish, strongly alkaline, and have a musty odor. They usually do not contain mucus, but may irritate the buttocks. The outlook in indigestion from an excess of protein is usually very good, as the condition is comparatively easy to remedy.

The general principle of treatment in the severe acute cases is to cut out the protein almost entirely and to

feed with sugar and starch. The protein cannot be cut out but for a few days, however, because the baby cannot live long without protein in its food. In the milder cases and in those in which the main symptom is the presence of the large casein curds, diminishing the protein or preventing the formation of the large curds by some of the measures which have been detailed, is sufficient.

Home Treatment of Indigestion.—While the general principles of the treatment of the various forms of indigestion due to an excess of the different food elements have been mentioned, it must be distinctly understood that mothers and nurses should not attempt to treat indigestion themselves. This is the province of the doctor, who alone can be expected to appreciate the significance of all the symptoms and to know just how much to increase or diminish the various food elements. Nothing has been said about the treatment of these conditions by drugs because this also is the province of the physician. It is always a safe thing, however, for the mother or nurse to stop the food entirely in acute disturbances of digestion and to weaken it with water in chronic disturbances. If a physician cannot be obtained at once in acute disturbances of digestion, it will do no harm, and may often do much good, to empty the baby's digestive tract by giving a cathartic and washing out the lower bowel. If the mother does not know how to wash out the lower bowel, she can, at any rate, give an enema. The best cathartic is castor oil. A young baby should be given 1 teaspoonful and an older baby a tablespoonful. Babies do not object to the taste of castor oil. It is better to give it plain, preferably in a warm spoon, so that it will not stick to it. If it is vomited, it should be repeated in an hour.

In milder cases 2 or 3 teaspoonfuls of the milk of magnesia may be given instead of the castor oil.

THE SYMPTOMS OF INDIGESTION AND THEIR TREATMENT

Loss of Appetite.—Loss of appetite is common to all forms of indigestion, but is usually more marked when it is due to an excess of fat. The treatment is, of course, to change the composition of the food. It is useless to give tonics, iron, or cod-liver oil.

Vomiting.—Vomiting in very young babies is sometimes due to an obstruction at the lower end of the stomach, which prevents the food from leaving it easily and quickly (spasm or stenosis of the pylorus). In such cases the vomiting is explosive, that is, the vomitus is thrown out of the mouth with considerable force. It usually occurs almost immediately after food is taken, and is the same no matter what food is given. In other cases vomiting is due to the swallowing of air during nursing. The vomiting usually occurs during or soon after feeding and the vomitus is the unchanged food. The remedy is to change the nipple or to sit the baby up, and allow it to raise the gas, every minute or two during the feeding. Vomiting is very frequently due to the fact that the baby is picked up and shaken or played with immediately after feeding. The muscle which closes the upper opening of the stomach is very loose in many babies, so that when the stomach contracts or the baby contracts its abdominal muscles, the milk is squeezed out. Vomiting of this sort can be much relieved by keeping the baby quiet after it is fed. In many instances, however, it will persist until the muscle becomes stronger as the baby grows older.

Vomiting may occur in all forms of indigestion. It is more common, however, in those due to fat and sugar

than in those due to protein. Vomiting may occur at any time in relation to food. The character of the vomitus depends partly on the length of time that the food has been in the baby's stomach. The stomach contents normally become more and more acid as digestion goes on, so that, except soon after a feeding, the vomitus will surely be acid. When the trouble is due to an excess of fat, the vomitus often has a rancid odor. When it is due to an excess of sugar, it is strongly acid and sometimes has the odor of vinegar. When it is due to an excess of protein, the vomitus often contains large, tough curds. Mucus in the vomitus usually comes from the throat, but may sometimes come from the stomach if the indigestion is severe.

Vomiting is often the first symptom of some acute illness. When vomiting is associated with fever, therefore, it is always advisable to call a physician. When vomiting is acute, that is, when it is not a common occurrence, the food should be stopped. Water should be given freely, however, even if it is vomited. It is often a good thing to dissolve a level teaspoonful of bicarbonate of soda (cooking soda) in a glass of water and to give a teaspoonful of this every ten or fifteen minutes. When the vomiting is a manifestation of some chronic disturbance of digestion the treatment is entirely by regulation of the diet.

Gas and Colic.—When gas is raised from the mouth, it is often simply air which has been swallowed during nursing. Picking the baby up every minute or two during the feeding, so that it can raise the gas, will usually prevent it from raising it later or having colic from it. Changing the nipple will also often prevent the swallowing of air. When gas is passed from the bowel there is usually excessive fermentation in the

bowel from a disturbance of the digestion. When the gas is passed, however, there is much less likely to be colic, colic being due to the distention of some portion of the bowel as the result of spasm of the bowel. The excessive fermentation is due to a disturbance of the digestion of one or more of the food elements. The treatment, therefore, is to cure the indigestion by proper regulation of the diet. In the meantime, however, the colic, which is a symptom of it, must be relieved. The simplest measures should be tried first. These are the administration of hot water by the mouth and the application of heat to the abdomen. Heat may be applied to the abdomen by means of a hot-water bag, an electric heating pad, or hot compresses. If these methods are unsuccessful, from 3 to 5 drops of the essence of peppermint may be given in 1 or 2 tablespoonfuls of hot water or a soda mint tablet may be dissolved in an ounce of hot water and given in teaspoonful doses. Five- or 10-drop doses of Wyeth's elixir of catnip and fennel in a tablespoonful of hot water may also be tried. It is not advisable to give paregoric, gin, or any other form of alcohol. If the colic persists, it can usually be relieved by an enema of warm water.

Diarrhea.—Diarrhea may be due to overheating, chilling, or excitement. In such cases the stools are simply increased in number and diminished in consistency. They are normal in other respects. The treatment is the removal of the cause and the temporary withdrawal or weakening of the food.

In most instances, however, diarrhea is a symptom of indigestion. If the indigestion is due to an excess of fat in the food, the stools are yellow or yellowish-green in color, and sometimes look oily. They have an acid or rancid odor, are acid in reaction, and irritate the but-

tocks. They often contain small soft curds and mucus. When the diarrhea is due to an excess of milk sugar or cane sugar the stools are more or less green, have an acid odor, are acid in reaction, and irritate the buttocks. They not infrequently contain mucus and sometimes small, soft curds. When the indigestion is due to one of the maltose-dextrins preparations the stools are yellowish-brown or brown, rarely green, are acid in reaction, have a peculiar acrid smell, and irritate the buttocks. They also may contain mucus and small, soft curds. When the diarrhea is due to an excess of starch the stools are yellow or yellowish brown, sometimes green, acid in reaction and odor, and irritating to the skin. They usually do not contain mucus or curds. When the diarrhea is due to an excess of protein in the food the stools are yellowish brown or brown, have a foul or musty odor, and are alkaline in reaction. They may, but usually do not, irritate the buttocks. They generally do not contain mucus or curds. The treatment of all forms of diarrhea consists primarily in the diminution of the offending food element or elements. In acute cases, when a physician cannot be obtained at once, it is advisable to stop all food, to wash out the bowel or give an enema, and to give a cathartic, preferably castor oil.

When the stools contain mucus and blood there is an acute inflammatory condition of the intestines, which is always serious and may be fatal. Food should be stopped, castor oil given, the bowel washed out, and a physician summoned at once.

Constipation.—Constipation as has already been stated in speaking of it in breast-fed babies, is not such a serious symptom as most mothers and nurses suppose. It is a relative term and really means a condition in which the

number of movements is less and the consistency of the movements greater than is normal for the individual on the diet which it is taking. Most artificially-fed babies, if they are doing well, do not have more than one stool daily. If they are not uncomfortable there is no cause for anxiety if they skip a day now and then. They should not, however, be allowed to skip more than two days. If they have more than three stools a day there is usually something wrong.

The most common cause of constipation in the artificially-fed during the first year is some error in the diet. In some instances the constipation is due to lack of food, there not being enough residue to form a sufficient amount of feces. The remedy is obvious. An excessive amount of fat in the food is the most common dietetic cause of constipation. In such cases the stools are large, light yellow in color and hard, or grayish or white in color, dry, and crumbly. The remedy is again obvious, namely, cutting down the amount of fat in the food. An excessive amount of starch is sometimes the cause of constipation. In such instances the stools are usually yellowish brown and dry. Cutting down the amount of starch will usually remedy the trouble. Constipation can hardly ever be directly attributed to sugar, yet babies taking milk sugar and cane sugar are rather more likely to be constipated than those taking the maltose-dextrins mixtures. Furthermore, the maltose-dextrins mixtures which contain the larger proportions of maltose are more laxative than those which contain a smaller proportion of maltose and a larger proportion of the dextrins. For example, Mellin's Food and Mead's Dextri-maltose, Number 3, are more laxative than Mead's Dextri-maltose, Number 1. A change in the sugar will, therefore, sometimes relieve constipation in babies.

Constipation is sometimes due to pain during the movement of the bowels as the result of a fissure, or crack, of the anus, the baby being afraid to have a movement of the bowels because of the pain which it causes. The crack is sometimes caused by diarrhea, but is usually due to previous constipation with the passage of large, hard stools. The remedy is to keep the stools a little loose and to grease the anus with a little vaselin or boric acid ointment after each movement. In other instances constipation is due to weakness of the intestinal and abdominal muscles as the result of a general disturbance of the nutrition. In such cases the remedy is, of course, the regulation of the food and life to cure the underlying causes. The constipation in many instances is apparently simply a manifestation of the normal peculiarity of the infantile bowel. The large bowel is normally longer in the baby than in the child and in the adult. It is sometimes so long that it bends on itself, so that the passage of the intestinal contents is mechanically interfered with. Time alone will remove this cause, as it is some years before the adult relations are established. Constipation is apparently sometimes hereditary. In other instances it is due to the administration of opium in the form of paregoric or soothing syrup. If anyone but the mother takes care of a baby these drugs should always be thought of as a possible cause.

While the cause of the constipation is being removed it is often necessary to do something to keep the bowels open. Increasing the amount of water which the baby takes will often help. Orange juice, in doses of from 1 to 4 tablespoonfuls daily, relieves many babies. If this is not sufficient, the same amount of prune juice may be tried, either in place of or in addition to the orange

juice. Toward the end of the first year baked apple or apple sauce may also be given. In little babies the addition of oat-water or the change from barley-water to oat-water, or vice versa, may help. Placing the baby, if old enough, on its chair at a regular time helps, as does regular massage of the abdomen.

If these measures are not sufficient, the bowels may be moved from below by enemas or suppositories or from above by the administration of drugs. In some cases it is better to move them from below; in others, from above. In any event, it is usually not wise to use any one method continuously.

Suppositories are usually preferable to enemas. The simplest form of suppository is a piece of paper, rolled up, and dipped in olive oil. Next to this is a piece of soap, preferably Ivory or Castile, about $1\frac{1}{2}$ inches long, as large around as a lead pencil, and sharpened at one end. A little more irritating to the bowel are the gluten suppositories, and next the glycerin suppositories. If glycerin suppositories are used, the long, slim kind, made for babies, is the best. Suppositories are the best method of treatment in cases in which the trouble is chiefly laziness on the part of the baby.

The simplest form of enema is the soapsuds. From 2 to 4 ounces is usually enough for a baby under one year of age. It is best given with a soft-rubber ear syringe, but may be given with a fountain syringe. If the stools are very hard and dry, they may be softened with an enema of from $\frac{1}{2}$ to 1 ounce of sweet oil, which is followed later by a soapsuds enema. The oil should be given with a hard-rubber or glass syringe, because oil spoils soft rubber. Glycerin or other strong enemas should never be given except on the advice of a physician. Great care must be taken in the use of both suppositories and

enemas not to establish a bad habit. It is very easy to so accustom the baby to them that it will not move its bowels without one of them, although the need of them has long passed.

The simplest laxative for babies is milk of magnesia. This is best given in one dose in the 6 or 9 p. m. bottle. The amount needed varies from $\frac{1}{4}$ teaspoonful to 2 teaspoonfuls. Some babies are, however, made uncomfortable by milk of magnesia or it is not efficient. In such cases one of the preparations of senna, such as castoria or cassafra, may be used. The dose varies from 10 drops to 1 teaspoonful. Olive oil may be given in doses of 1 or 2 teaspoonfuls. When the constipation is due to an excess of fat, olive oil will increase it. Furthermore, olive oil, being simply a form of fat, may cause indigestion. It is, therefore, not as safe a laxative as milk of magnesia. Castor oil should never be used continuously as a laxative. It is the best drug to use in an acute illness and emergencies, but it does cause some irritation of the bowels, and is almost always followed by constipation.

Chapter XIII

FEEDING IN THE SECOND YEAR

AT the beginning of the second year the baby will usually be taking five feedings at three-hour intervals between 6 and 6, or four feedings at four-hour intervals from 6 to 6. At some time during the first half of the second year these regular intervals are changed to the irregular intervals usual for older children. Then, if the baby wakes early, it gets a drink of milk on waking, and has its breakfast in the neighborhood of 8 o'clock. If it wakes late, it has nothing before breakfast. If the bath is given in the morning, the breakfast may be given a little later. In such cases, however, milk must be given on waking. The baby has some milk, or milk with a piece of bread or cracker, between 11 and 11.30, just before its nap. It has its dinner between 1 and 2, according to when it wakes up, and its supper between 5 and 5.30, being tucked in for the night by 6, at the latest. During the first half of the second year the breakfast should consist of milk, cereal, and bread, toast, zwieback, or cracker. The orange juice is usually given about an hour before the lunch. The dinner consists of broth or beef juice, with bread, zwieback, rice, or macaroni. It may have milk or a plain dessert, such as junket, plain blanc mange, cornstarch pudding, prune juice, baked apple, or apple sauce. Its supper is the same as breakfast, except that, if it is constipated and needs prune juice, baked apple, or apple sauce, they may be given with

the supper instead of with the dinner. The bread may be given in the form of milk-toast, that is, toast bread soaked in hot milk without thickening.

When the baby is a year and a half old baked potato and soft-boiled or coddled eggs may be added to the diet. They should both be given at dinner. If the egg does not disturb it, it may have baked custard as another dessert, but never on the same day that it has a boiled or coddled egg. Butter may be begun at about the same time. Further additions to the desserts are plain tapioca and apple tapioca. It should go without saying that they are to be served without sugar and without cream, either plain or whipped. Wheatena, wheat germ, germea, and Ralston may be added to the list of cereals.

Green Vegetables and Iron.—We do not believe that green vegetables should be given to children before they are two years old unless there is some special reason for it. It is true that they sometimes help constipation, but constipation can be relieved in babies more safely in other ways. It is often said that they are necessary in order to give the proper amount of iron and of other salts to babies. The baby that takes a quart of milk a day gets a far greater amount of the salts, except of iron, than it needs. There is, moreover, enough iron in a quart of milk to cover more than two-thirds of the baby's daily need of iron. It is often thought that because certain vegetables are green, and carrots are yellow, that they contain large amounts of iron. It is forgotten that the green color of vegetables is due to chlorophyll, which contains no iron, and the yellow color of carrots to carotin, which also contains no iron. Two tablespoonfuls of beef juice contain more iron than 2 ounces of fresh spinach, 4 ounces of string beans, or 9 ounces of carrots. The yolk of an egg contains almost

TABLE IV
DIET AT EIGHTEEN MONTHS

Milk	Zwieback	Plain macaroni
Butter	Plain crackers	Baked potato
Mutton broth	Barley jelly	Junket
Chicken broth	Strained oatmeal	Baked custard
Beef juice	Cream of Wheat	Cornstarch pudding
Soft-boiled eggs	Wheat germ	Plain blanc mange
Coddled eggs	Ralston	Orange juice
Stale bread	Farina	Prune juice and pulp
Milk-toast	Rice	Baked apples

6.00 A. M. Milk, 8 ounces.

8.00 A. M. Cereal.
Breakfast: Bread, zwieback, or cracker.
Milk, 8 ounces.

10.00 A. M. Orange juice.

11.00-11.30 A. M. Bread, zwieback, or cracker.
Lunch: Milk, 8 ounces.

1.00-2.00 P. M. Broth, beef juice, or egg.
Dinner: Rice, baked potato, macaroni, bread, or
zwieback.
Junket, baked custard, cornstarch, blanc
mange, prune juice, or baked apple.
Milk, 4 to 8 ounces, if desired.

5.00-5.30 P. M. Cereal.
Supper: Bread, zwieback, crackers, or milk-toast.
Milk, 8 ounces.
Prune juice or baked apple, if constipated,
and not had at dinner.

as much iron as 2 tablespoonfuls of beef juice. It is evident, therefore, that babies taking the simple diet just described will not suffer from the lack of iron or other salts because it does not contain green vegetables.

It is sometimes said, also, that babies will suffer from a lack of vitamins, if they are not given green vegetables before they are two or two and a half years old. This is not true, because there is an abundant supply of both the fat-soluble A and the water-soluble B in a quart of milk and of the antiscorbutic vitamin in orange juice, without taking into consideration the vitamins present in the other foods.

Chapter XIV

FEEDING FROM TWO TO SIX YEARS

THE milk in the early morning should be continued or be replaced by a piece of bread and butter or a cracker if the child continues to wake up early and does not have its breakfast until late. If it wakes up late, and has its breakfast early, it should be stopped. The lunch before the nap should be continued as long as the child has its nap, that is, until it is prevented from having its nap, or at least a rest, by going to school. If it has its dinner at 12, and its rest afterward, it needs nothing between breakfast and dinner, but will then need something in the middle of the afternoon. It should have its supper between 5 and 6 and, even when it is five or six years old, should be in bed by 6.30 or, at the latest, 7 o'clock. It should have nothing whatever between meals.

Meat.—At two years the simple meats, like the white meat of roast or boiled chicken, lamb or mutton chop and scraped beef, may be given. Meats, contrary to the general impression, are easily digested by young children, and almost never cause trouble. Contrary to the common belief, the red meats contain no more extractives and are no more irritating to the kidneys than are the white meats or fish.

A fundamental principle in feeding is that foods that are cooked over are very much less digestible than foods which have been cooked but once. Cold meat is much more digestible than meat which has been made into

hash or croquettes and recooked. There is no reason why children should not have cold meat. Minced meat, that is, chopped meat, heated with water or water with a little thickening, and served on toast, is quite easily digested. Children should not be given gravy because of the cooked fat which it contains. For the same reason they should not be given dish gravy unless it is cooled and the fat removed.

Bacon.—We do not approve of giving bacon to babies. It is generally admitted that fried fat is very indigestible not only for babies but also for children and adults. We fail to see why fried pig's fat, of which bacon is largely composed, should be any more digestible than any other form of fried fat. No one thinks of giving roast pork or fried or boiled ham to babies, and yet these forms of pig meat should be more easily digested, because of the way they are cooked, than is bacon. There is, furthermore, no reason to believe that the meat of the pig is any better suited for babies and young children than that of sheep and kine. We therefore do not give bacon to babies and young children.

Green Vegetables.—At two and a quarter or two and a half years the green vegetables may be begun. The most easily digestible are spinach, string beans, peas, asparagus, and cooked celery. Peas should always be mashed in the beginning and preferably put through a sieve. Spinach should always be put through a sieve and string beans usually. It is not necessary to strain asparagus and celery. There is no objection to the use of canned peas, string beans, and spinach. Canned asparagus is usually somewhat indigestible.

TABLE V

DIET AT TWO YEARS

Milk	Stale bread	Baked potato
Butter	Toast bread	Plain macaroni
Mutton broth	Milk-toast	Junket
Chicken broth	Zwieback	Baked custard
Beef juice	Plain crackers	Cornstarch pudding
Soft-boiled eggs	Barley jelly	Plain blanc mange
Coddled eggs	Strained oatmeal	Orange juice
Lamb chop	Cream of Wheat	Prune juice and pulp
Mutton chop	Wheat germ	Baked apple
Roast chicken	Ralston	Apple sauce
Boiled chicken	Farina	
Scraped beef	Rice	

6.00 A. M. Milk, 8 ounces.

8.00 A. M.
Breakfast: Cereal.
Bread, toast, zwieback, or cracker.
Milk, 8 ounces.

10.00 A. M.: Orange juice.

11.00-11.30 A. M.
Lunch: Milk, 8 ounces.
Bread, toast, zwieback, or cracker.

1.00-2.00 P. M.
Dinner: Broth, broth and meat, beef juice, meat, or
egg.
Rice, baked potato, macaroni, bread, zwie-
back, or cracker.
Junket, baked custard, cornstarch, blanc
mange, prune juice or pulp, baked apple,
or apple sauce.
Milk, 4 to 8 ounces, if desired.

5.00-5.30 P. M.
Supper: Cereal.
Bread, toast, milk-toast, zwieback, or
cracker.
Prune juice or pulp, baked apple or apple
sauce, if constipated, and did not have
at dinner.
Milk, 8 ounces.

TABLE VI

DIET AT TWO AND ONE-HALF YEARS

Milk	Milk-toast	String beans
Butter	Zwieback	Spinach
Mutton broth	Plain crackers	Asparagus
Chicken broth	Plain educators	Cooked celery
Beef juice	Barley jelly	Orange juice
Soft-boiled eggs	Strained oatmeal	Prune juice and pulp
Coddled eggs	Cream of Wheat	Baked apple
Dropped eggs	Wheat germ	Apple sauce
Lamb chop	Wheatena	Junket
Mutton chop	Germea	Baked custard
Roast chicken	Ralston	Cornstarch
Boiled chicken	Farina	Bread pudding
Scraped beef	Rice	Rice pudding
Stale bread	Baked potato	Plain blanc mange
Toast bread	Plain macaroni	Plain tapioca
Whole wheat bread	Peas	Apple tapioca
6.00 A. M.	Milk, 8 ounces.	
8.00 A. M.	Cereal.	
Breakfast:	Bread, toast, zwieback, or cracker; occasionally an egg.	
	Milk, 8 ounces.	
10.00 A. M.	Orange juice.	
11.00-11.30 A. M.	Milk, 8 ounces.	
Lunch:	Bread, toast, zwieback, or cracker.	
1.00-2.00 P. M.	Broth, broth and meat, beef juice, meat, or egg.	
Dinner:	Rice, baked potato, macaroni, bread, zwieback, or cracker.	
	Peas, string beans, spinach, asparagus, or cooked celery.	
	Junket, baked custard, cornstarch, blanc mange, bread pudding, rice pudding, plain tapioca, apple tapioca, prune juice and pulp, baked apple, or apple sauce.	
	Milk, 4 to 8 ounces, if desired.	

5.00-5.30 P. M.	Cereal.
Supper:	Bread, toast, milk-toast, zwieback, cracker toast, or cracker milk-toast.
	Prune juice or pulp, baked apple, or apple sauce if desired.
	Milk, 8 ounces.

Meat and Fish.—During the third year other simple meats, such as roast lamb, roast or boiled mutton, roast beef and beef steak, may be added to the diet. Boiled and broiled fish may also be given. The most digestible fishes for young children in the Eastern states are cod, halibut, schrod, and haddock. The oily and rich fishes, such as swordfish and salmon, should not be given to them. Fish should never be fried.

Cereals.—The list of cereals may be increased by the addition of Pettijohn's Breakfast Food, hominy, cracked wheat, and shredded wheat biscuit. Shredded wheat biscuit is the only one of the cereals which are not cooked in the home which we think suitable for young children. It is true that children like the cereals which are not cooked in the home, especially some of the sweet ones. It is also true that they are easier to serve since they require no preparation. Nevertheless, we do not feel that they are as easily digested as the cereals which are cooked in the home. We object especially to the sweet ones, because the sweetness is due to the fact that the starch has been largely changed into sugar.

Vegetables.—Potatoes may also be given mashed, boiled, and stewed or creamed. Carrots may be begun, but at first should be mashed. Both summer and winter squash may be given, also plain boiled cabbage and cauliflower. Cabbage and cauliflower are very easily digested if they are not served with a cream sauce. Cabbage should never be given raw. We do not approve

of tomatoes, beets, and corn for children. Corn, even when green and when the kernels are cut, often causes severe, or even fatal, indigestion in children. Beets are sweet and tough, even when young, and difficult to digest. It is true that the juice of cooked tomatoes is an antiscorbutic and that it has been used successfully both for the prevention and cure of scurvy in young babies, when orange juice for some reason could not be taken or was too expensive. It has apparently been believed that, because certain babies have been cured of scurvy by tomato juice, tomato juice is, therefore, a necessary or, at any rate, an advisable article of diet for all babies and children. This belief is wrong. Tomatoes are strongly acid and, when given raw or even when given in any quantity cooked, are very likely to disturb the digestion of children, as also of many adults.

Fruits.—Pears and peaches may be given cooked at three or four years. In general, it is not advisable to give them uncooked before the child is five years old. As a rule, peaches are more easily digested than pears. The pulp of the orange may be given at four years. We do not think that grapefruit should be given to young children. It is very acid, and the pulp is coarse and indigestible. Some children can digest bananas without difficulty from the time they are three or four years old. Other children always have trouble from them. It is advisable, therefore, to find out whether the individual child can digest them or not. If it can, bananas are a valuable form of fruit. They are rather more digestible when baked, and, of course, when taken raw, should be scraped or cut into fine pieces. We do not believe in giving raw apples to children, at any rate, before they are six years old. Raw apples are indigestible for many children, as well as adults, even when they are scraped.

The old saying that "an apple a day keeps the doctor away" has been a great boon for those physicians who specialize in the diseases of children.

Berries.—Uncooked berries should not be given to children before they are six years old. Cooked strawberries and blueberries may, however, be given cautiously after children are four years old. Melons are not a suitable form of food for young children; nor are nuts.

Desserts.—The list of desserts may be increased during the third year by the addition of prune whip, the simple gelatins, and bread and rice puddings, made, of course, without raisins. It should also go without saying that all these desserts should be served without additional sugar, cream, either plain or whipped, or other sauces. Soft custard, for some reason, is much less easily digested by most children than is baked custard. Chocolate should never be used in the preparation of children's desserts.

Cookies, Cake, and Ice-cream.—Plain cookies may be given as a dessert, or with supper, after children are four years old. They should never be given between meals. The only form of cake allowable for children between four and six years old is sponge cake. We feel, however, that they would be better off without this, as they would likewise be much better off without ice-cream. If mothers and nurses are determined to give children ice-cream, as they apparently are, it should not be given more than once a week, and vanilla ice-cream should be the only form.

Milk.—Children should continue to drink a quart of milk daily, certainly until they are six years old, and preferably longer. It is inadvisable to add cocoa or chocolate to it. They add little to the nutritive value of the milk, and do disturb the digestion of many children.

TABLE VII
DIET AT FOUR YEARS

Milk	Milk-toast	Winter squash
Butter	Oatmeal	Cooked celery
Mutton broth	Pettijohn	Carrots
Chicken broth	Cream of Wheat	Lettuce
Bouillon	Wheat germ	Cabbage
Vegetable soup	Wheatena	Cauliflower
Milk soups	Germea	Stewed prunes
Purées of peas	Ralston	Baked apples
and beans	Farina	Apple sauce
Soft-boiled eggs	Hominy	Cooked pears
Dropped eggs	Samp	Cooked peaches
Scrambled eggs	Rice	Cooked apricots
Lamb chop	Cracked wheat	Oranges
Mutton chop	Shredded Wheat	Bananas
Beef steak	Biscuit	Cooked strawberries
Roast lamb	Baked potato	Cooked blueberries
Roast mutton	Boiled potato	Junket
Boiled mutton	Mashed potato	Baked custard
Roast chicken	Stewed potato	Cornstarch
Boiled chicken	Plain macaroni	Bread pudding
Broiled chicken	Plain spaghetti	Rice pudding
Minced meat	Peas	Plain tapioca
Turkey	String beans	Apple tapioca
Boiled fish	Spinach	Plain blanc mange
Broiled fish	Beet greens	Prune whip
White bread	Swiss chard	Gelatins
French bread	Asparagus	Plain cookies
Whole wheat bread	Lima beans	Sponge cake ¹
Plain crackers	Summer squash	Vanilla ice-cream ¹

On waking, if it is early, bread or cracker; orange juice, if desired.

7.00-8.00 A. M.	Cereal.
Breakfast:	Bread.
	Meat, fish, or egg.
	Milk.

¹ Not oftener than once a week.

11.00 A. M.	Milk.
Lunch:	Bread or cracker.
1.00-2.00 P.M.	Soup—not necessary.
Dinner:	Meat, fish, or egg. Do not give egg if had egg at breakfast.
	Potato, rice, macaroni, or bread.
	Green vegetable.
	Dessert or fruit.
	Milk, if desired.
5.30-6.00 P. M.	Cereal.
Supper:	Bread or cracker in some form.
	Cooked fruit.
	Milk.

If nap is taken after dinner, dinner should be at 12.00 M. and lunch at 4.00 P. M.

Children will take milk without any additions without question if they are brought up properly, and it is not suggested to them that something should be added to their milk. Cream, while nutritious, is not a suitable article of diet for children. It is almost certain to disturb their digestion if given continuously. It goes without saying, of course, that no young child should be given tea or coffee. Milk soups are allowable, but stews and chowders are quite indigestible. So is oyster stew, because of the heated butter in it.

Eggs.—Children should never be given fried eggs, and omelette, even when plain, is much less digestible than are eggs which are boiled, coddled, dropped, or scrambled. Few children can take eggs more than once daily without getting into trouble. It is better to give eggs at breakfast than at supper.

Bread and Crackers.—It is very important to have bread thoroughly cooked, because, if it is not, it is extremely indigestible. Whole wheat bread has but very

little, if any, more nutritive value than bread made from white flour. It does contain a larger amount of water-soluble B vitamin, and if a child ate nothing but bread it would be far better for it, on this account, to eat whole wheat bread. The child who takes milk and a reasonable, general diet, however, will get far more of the vitamin B in them than it needs. The vitamin in the whole wheat bread is, therefore, of no practical importance. The same thing is true of brown and polished rice. The vitamin B is removed with the polishings, and people who live almost exclusively on polished rice develop beriberi from the lack of it. Children, who drink milk and eat a general diet, get so much of this vitamin in their milk and other food that it makes no difference to them whether the rice is brown or polished. As a matter of fact, when children are taking the ordinary American general diet, there is no need of thinking anything about vitamins. Graham bread and rye bread, unless light and thoroughly cooked, are quite indigestible. Properly cooked Graham bread is seldom seen. Bread should be at least forty-eight hours old before it is given to children. They should not be given, under any conditions, hot bread, biscuits, or griddle cakes. Bread which is dried in the oven or thoroughly toasted through is very easily digested. Bread which is just browned or burned on the outside, the center being damp and sticky, is extremely indigestible. Unfortunately, this is the kind of toasted bread which most people are in the habit of eating. Buttered toast is indigestible because it is soggy and the fat in the butter has been heated. Toast should not be buttered until it is eaten. Brown bread is always heavy, soggy, and sweet, and is entirely unfit for consumption by children.

Many people have an idea that crackers are not nutri-

tious. This idea is erroneous because crackers are composed almost entirely of starch. Bulk for bulk and weight for weight, crackers are far more nutritious than bread, because bread contains so much water and is so porous, while crackers contain practically no water and are much less porous. The best crackers for children are the plain white crackers, like Unceda Biscuit, Pilot Wafers, and Pilot Biscuit, soda crackers, and the old-fashioned Boston crackers. They should not be given the sweetened, flavored, and fancy crackers. Graham crackers are entirely unsuitable. They are much too sweet and not easily digested. Oatmeal crackers should not be given, as the starch in the oatmeal is not thoroughly cooked. Bran crackers may be given in the treatment of constipation, but it must be remembered that the bran has no nutritive value. They should, moreover, be given only on the advice of a physician, because, while bran is of use in the treatment of certain forms of constipation, it may do great harm in others.

Sugar.—There is no article of food which causes more disturbances of digestion in childhood than sugar. As money is said to be the root of all evil, so sugar may be said to be the root of all the disturbances of digestion in childhood, neither statement being, of course, strictly true. Further than this, sugar is a very common cause of loss of appetite in children, and destroys their appreciation of proper food. It also, more than any other one thing, is responsible for the decay of children's teeth. Candy, therefore, should never be given to children. It can do them no good and may do them much harm. It is idle, of course, to claim that two or three pieces of candy a day will disturb the average child's digestion or prevent its normal development. Children that have two or three pieces, however, usually want more, and

TABLE VIII

DIET AT SIX YEARS

Milk	Plain crackers	Shell beans
Butter	Milk-toast	Summer squash
Mutton broth	Oatmeal	Winter squash
Chicken broth	Pettijohn	Cooked celery
Bouillon	Cream of Wheat	Carrots
Vegetable soup	Wheat germ	Lettuce
Milk soups	Wheatena	Cauliflower
Purées of peas and beans	Germea	Cabbage
Soft-boiled eggs	Ralston	Stewed prunes
Dropped eggs	Farina	Baked apples
Scrambled eggs	Hominy	Apple sauce
Shirred eggs	Samp	Cooked pears
Plain omelette	Cornmeal	Cooked peaches
Lamb chop	Rice	Cooked apricots
Mutton chop	Cracked wheat	Oranges
Beef steak	Shredded Wheat	Grapes
Roast lamb	Biscuit	Bananas
Roast mutton	Baked potato	Cooked strawberries
Boiled mutton	Boiled potato	Cooked blueberries
Roast chicken	Mashed potato	Junket
Boiled chicken	Stewed potato	Baked custard
Broiled chicken	Plain macaroni	Cornstarch
Minced meat	Plain spaghetti	Bread pudding
Turkey	Cream cheese	Rice pudding
Boiled fish	Cottage cheese	Plain tapioca
Broiled fish	Peas	Apple tapioca
White bread	String beans	Plain blanc mange
French bread	Spinach	Prune whip
Whole wheat bread	Beet greens	Gelatins
Corn bread	Swiss chard	Plain cookies
Gems	Asparagus	Sponge cake ¹
	Lima beans	Vanilla ice cream ¹

On waking, if it is early, bread or cracker; orange juice, if desired.

¹ Not oftener than once a week.

7.00-8.00 A. M.	Cereal.
Breakfast:	Bread.
	Meat, fish, or egg.
	Milk.
11.00 A. M.	Milk.
Lunch:	Bread or cracker.
1.00-2.00 P. M.	Soup—not necessary.
Dinner:	Meat, fish, or egg. Do not give egg, if had egg at breakfast.
	Potato, rice, macaroni, or bread.
	Green vegetable.
	Dessert or fruit.
	Milk, if desired.
5.30-6.00 P. M.	Cereal.
Supper:	Bread or cracker in some form.
	Cooked fruit.
	Milk.

The dinner hour may have to be earlier if there are two sessions of school. If there is only one session, the rest after dinner should be continued. If there are two sessions, the child should be kept as quiet as possible between the sessions.

are quite likely to get more. It is true that some kinds of candy are richer and more indigestible than others, but they are all made of sugar, and plain sugar is bad for children. Children should be brought up not to eat sugar on anything. There is no objection to putting a little sugar in the food during its preparation, but no sugar should be put on it when it is served.

It is often said that sugar is a necessary article of diet for children. This belief is fostered by the manufacturers of sugar and of candy. It is, however, not true. Carbohydrates are advisable for children as a source of energy. They are not absolutely necessary, however, as is shown by the fact that Eskimo children

grow up without them. There are two forms of carbohydrates—the starches and the sugars. During the process of digestion the starches are all changed to sugar before they are absorbed and utilized in the body. There is, therefore, no need of sugar. The reason that sugar causes indigestion, when it is given as sugar, is because so much sugar is introduced into the digestive tract at one time that it cannot be absorbed fast enough to prevent excessive fermentation and consequently indigestion. When starch is changed to sugar, the conversion is so slow that the sugar can be absorbed before there is an opportunity for excessive fermentation.

Ice-cream, Ice-cream Soda, and Other Sweet Drinks.—These are always inadvisable for and usually harmful to children. They are harmful chiefly because of the sugar which they contain, but partly because they are too cold, partly because they are too rich, and partly because they are usually taken between meals. Children would be better off without any of them. Ice-cream is probably less harmful than the others. Vanilla ice-cream is not as rich as other kinds. The majority of people are so willing to take the chance of injuring their children's health in order to give them temporary pleasure that we have found it useless to attempt to cut ice-cream entirely out of the diet of children. We therefore compromise, and allow children to have plain vanilla ice-cream without any sauce on it once a week.

Water.—Children need a great deal of water. They are very active and consequently lose much water in the perspiration and in the expired air. They, like adults, need more water in hot weather than in cold, and in dry weather than in moist. Strange as it may seem, many young children are so interested in their play that they do not realize that they are thirsty, and have to be re-

minded that they need a drink. Children should be watched to see that they get enough water in the twenty-four hours. In general, it is wiser for them to take their water between meals. There is, however, no objection to the drinking of water with the meals, provided it is not used to wash down imperfectly chewed food. It is, indeed, a good plan to finish a meal with a drink of water. A child cannot drink too much water; it may drink too little. It is not necessary to boil the water, provided it is pure, after the first year.

Light Suppers.—Children should not have meat or vegetables for supper until they are at least six years old. Broths and eggs should be given only occasionally. Milk, cereal, bread or crackers in some form, and cooked fruit are amply sufficient for them.

UNWILLINGNESS TO EAT

Young children, especially if they have been carefully fed and have not been allowed to eat promiscuously, often refuse to eat new articles of food. They are likely to be suspicious of every new thing, and quite likely to dislike its taste. They must be made to eat what is given them, however, whether they like it or not, because it is most important for older children and adults to eat a general diet. If a baby is made to eat each new thing that is given to it, it soon understands that it has to do so, and never refuses it afterward. A baby should be made to eat its foods as they are given to it, even if its nose has to be held in order to make it swallow. Extreme measures of this sort have to be taken but a few times, however, to teach a child that it has to obey. After this it never occurs to it to disobey. It is rarely necessary, however, to use force, and babies and children can almost always be made to eat new things if sufficient

patience and tact are exercised. If, however, a child has a real distaste for some given article of food, it is not fair to give it to him too often. It should be given occasionally and then he should be made to eat it, but discretion should be exercised in giving it. It will almost always be found that, when a child has a marked distaste for some article of food, this distaste was suggested to him by one of his parents or grandparents. A child believes, unfortunately often foolishly, that his parents are always right. It is perfectly reasonable, therefore, for a child, when it hears one of its parents say that he or she cannot eat a certain article of food, to think that there must be something the matter with that food, and to refuse to eat it without trying it. Parents must be very careful, therefore, not to make such suggestions to their children. They should simply not eat the things which they dislike, and not call the child's attention to the fact that they are not eating them or dislike them. It is perfectly foolish, of course, to believe that any like or dislike of a food can be inherited.

Many children are unwilling to eat because they are too much interested in other things. These children will usually eat much better alone. Other children are so busy that they cannot take the time to eat. They rush in to the table, eat just enough to satisfy the pangs of hunger, then rush off again. These children should be made to stay at the table until they have slowly eaten the proper amount of food. They should not be allowed to gulp their food or to wash it down. A good way to train such children to eat properly is to make them stay at the table until everyone else is finished, no matter how long it is after they have finished their food. If they are made to stay at the table after they are through, the inducement to gulp their food is taken away.

Tastes of Food.—Many children are constantly teasing for articles of food which they ought not to have. They are a nuisance to themselves and to everyone else. The reason that they act so is because they have been badly brought up and have been given tastes of various things. Naturally, if they have a taste of one thing, they cannot understand why they should not have a taste of everything. They do not understand, and cannot be expected to understand, that some foods are digestible and others are not. The child that has been properly brought up, and has never been given a taste of anything but its own food, never expects to have anything but its own food, and consequently never asks for it. It never occurs to it that it can eat anything except what is given to it. As so many people are weak-minded and soft-hearted, it is not advisable to have young children come to the table. If they do not, they are not led into temptation and may, perhaps, be delivered from evil. In any case, a young child should have its supper alone, so that it will not be dissatisfied with a simple supper and can get to bed early.

Routine Diet.—It is often said that children will get tired of such a routine diet and of the sameness of their food, and that they need a greater variety. This is not true. Children that have always been properly fed and have never been given tastes of things, if they are well, do not tire of their simple diet, any more than the dog tires of his meat and bones or the horse of his hay and grain. When a child that has been properly fed loses its appetite, the trouble is never with the sameness of the food. The loss of appetite always means that it is ill in some way or that it is overtired, either physically or mentally. When the cause is removed, its appetite will return. It will never be brought back by increasing

the variety of the food. If less digestible food is given, the child may take it temporarily, but it will shortly refuse this in the same way. If still more indigestible and improper food is given, it may take this for a few days, but will soon again refuse to take it. In the meantime the underlying condition, especially if it is indigestion, grows steadily worse.

Loss of Appetite.—Loss of appetite in a child is always a symptom of indigestion, the onset of some disease or overfatigue, either physical or mental. It is never due to routine diet or to the sameness of the food. If a child loses its appetite, it is evident, therefore, that it should not be “tempted” by giving it indigestible articles of food which it ought not to have when well. Such things will do it even more harm when it is sick than when it is well. They will never bring back the appetite more than temporarily. When a child loses its appetite, therefore, the proper procedure is to cut down the amount of its food and to make it even simpler.

THE FEEDING OF SICK CHILDREN

It seems evident that the digestive powers of a sick child must be weaker than those of a well one. Nevertheless, the tendency of most people is to give sick children “delicacies,” that is, indigestible articles of food, in order to get them to eat. This is, of course, entirely wrong, as, with the weakened digestive powers, the food should be cut down and made more simple. There need be no fear that a sick child will die of starvation. In most cases, in fact, partial starvation is one of the best methods of treatment.

Chapter XV

INDIGESTION IN YOUNG CHILDREN

INDIGESTION in young children may be either acute or chronic.

ACUTE INDIGESTION

Acute indigestion is usually due to indigestible food, but may be due to excitement, fatigue, overeating, chilling, or eating too hurriedly. There is usually some fever, loss of appetite, nausea, and more or less vomiting. There is likely to be abdominal pain, and usually diarrhea, but the bowels may be constipated. Many of the acute diseases, however, may begin with the same set of symptoms. It is never wise, therefore, to take it for granted that a child has indigestion and therefore not to send for a physician. While waiting for the physician it is advisable to stop all food. Water may be given freely. If the child is vomiting, it may help if a level teaspoonful of bicarbonate of soda (cooking soda) is dissolved in a glass of water and from a teaspoonful to a tablespoonful of this given every ten or fifteen minutes. It is also advisable to give a dose of 1 or 2 tablespoonfuls of castor oil. If this is vomited, it should be tried again in from one-half hour to an hour. If it is again vomited, repeated doses of from $\frac{1}{2}$ to 1 teaspoonful of milk of magnesia, at one-half-hour intervals, may be given, or one of the senna preparations, such as Castoria. It is also wise to give a large soapsuds enema.

CHRONIC INDIGESTION

Indigestion in young children may be due to over-fatigue, either physical or mental, to diseases outside

of the digestive tract, to diseases of the digestive tract itself, to improper methods of eating, to an excess of proper food, or to improper food. The first three of these causes bring on indigestion by decreasing the powers of digestion; the others, by increasing the work to be done in digestion. After indigestion has developed the symptoms are, in general, the same, whatever the cause. There is loss of appetite, failure to gain in weight, coated tongue, bad breath, more or less colic and gas, sometimes nausea and vomiting, often constipation or looseness of the bowels. The complexion becomes sallow or pasty; the skin and hair dry. The child is irritable, cries easily, and sleeps poorly. In some of the more severe cases there are other special symptoms, which vary according to the type of food which is causing the indigestion.

When, therefore, a child has indigestion, the first thing to do is to find out the cause of the indigestion. A careful detailed study of its whole life and diet must be made. It will often be found that the child does not get enough rest and sleep, that it is playing too hard or too long, that it has too many social engagements, or too much excitement. It may be that there is friction in the school, in the home, or with other children in play. If such causes are found and are removed, the child will recover promptly without regulation of the diet and without taking any drugs. In fact, no matter how much the diet is regulated or how many drugs are given, the child will not recover until the real cause of the indigestion is removed.

Careful study and examination will often show that the child has some other disease which is responsible for the indigestion. It will be found, perhaps, to have chronic disease of the tonsils, some disturbance of the

urinary tract, or decayed or abscessed teeth. When these conditions are cured the child will promptly recover from the indigestion. Again, no amount of regulation of the diet or of medicines will cure the child unless the cause is removed.

Primary disease of the digestive tract is very uncommon in childhood. If there is disease of the digestive tract or disturbances of its functions, they are almost invariably due to improper methods of eating, to too much food, or to improper food. Many children eat hurriedly when they are hot and tired; they gobble their food and rush out to play. Sometimes they come home from school, tired and nervous, and eat a hearty meal. Sometimes they swallow their food without properly chewing it or wash it down with liquids. When they hurry, they often eat more than they would if they ate properly. The indigestion, when due to these causes, disappears promptly when they are removed. Children must not be allowed to rush in from play, eat, and rush out again. They must not be allowed to eat if they are tired and nervous. They must be made to rest before eating, then eat slowly and quietly, and, perhaps, rest again after eating. They must be made to chew properly, and must not be allowed to wash their food down with liquids. When these rules are followed the indigestion stops.

Too much proper food is seldom the cause of indigestion. It is far more often due to improper food. The great majority of people feed their children improperly. They give them too large a variety of food for their age and, usually, altogether too large an amount of sweets. Children that are fed as has been detailed above will rarely have indigestion unless they are ill from some other cause, overtired, or eating improperly. In most cases of indigestion from eating improper foods in children no

special type of indigestion has been established, and the indigestion will yield promptly to reasonable regulation of the diet, that is, to the elimination of improper articles of food. Drugs are unnecessary in these cases and ordinarily useless. It does no good to give a tonic or anti-fermentative when the improper articles of food are continued.

In the more severe cases of indigestion an intolerance for one or more of the food elements has become established and, in addition, there may be abnormal fermentation in the intestinal contents. That is, indigestion in children may be classified in the same way as was indigestion in infancy. In children, however, indigestion with an intolerance for fat is not as common as indigestion with an intolerance for carbohydrates. Indigestion with an intolerance for sugar is more often acute than chronic and usually yields easily to treatment. Indigestion with an intolerance for starch is usually chronic, often severe, and very hard to cure. Indigestion with an intolerance for protein is not at all common, and is easily relieved. The symptoms of these different types of indigestion are very similar, so much so, indeed, that no layman can be expected to distinguish between them. The examination of the stools is of the same importance that it is in infantile indigestion, but the changes are more difficult of recognition. When the disturbance is largely in the digestion of fat, the stools are usually large, soft, gray, and strongly acid. They often contain mucus. When the trouble is due to sugar, the stools are loose, yellow or green, frothy, and acid. They often contain mucus and irritate the skin. In mild cases of starch indigestion the stools are loose, yellowish brown or green, acid, and irritating. In the severest cases the stools are large, mushy, brown or brownish gray, very strongly acid,

and contain considerable mucus. Their odor is the combination of a foul odor with that of butyric acid, more like that of a pigpen than anything else. There is nothing characteristic about the stools of protein indigestion. When there is fermentation the stools will float in water and look spongy.

TREATMENT

The so-called digestants, such as pepsin, hydrochloric acid, pancreatin, and the bile salts, are, in our opinion, useless in the treatment of these conditions. There is no place for drugs, except for the temporary relief of symptoms. Tonics, appetizers, and antifermentatives do not remove the cause of the disease or cure it.

Regulation of the life of the child and the enforcement of proper methods of eating will relieve many of the milder cases. The main treatment, however, consists in regulation of the diet to meet the digestive powers of the individual child. The food element or elements which it cannot properly digest must be cut down to the point where it can digest them, and the deficiency in these elements made up by an increase in the other food elements. In mild cases of fat indigestion it is usually sufficient to cut out butter, cream, and bacon, and to limit the number of eggs. In the more severe cases the milk must be skimmed and eggs cut out entirely, while, in the severest cases only the fat-free milk, obtained by centrifugalization, can be taken. Indigestion due to sugar usually yields promptly when sugar and all sweets are cut out of the diet. Starch indigestion is more often due to potato starch than any other. Such cases are relieved at once when potatoes are cut out of the diet. In other instances it is necessary to reduce the starch materially, sometimes cutting out all starchy foods. In

other cases children can take one form of starch and not another; that is, they can, for example, take the starch of rice and wheat and not that of corn and oats. In most cases of protein indigestion temporarily limiting the proteins to those in milk and vegetables is usually sufficient.

In the most severe cases of indigestion it is necessary to limit not only the quality but also the quantity of each food taken at each meal in order to get the proper amounts of the different food elements and yet supply the proper number of calories. This means that the physician must know the composition of foods and their caloric values, and that he is willing to teach and the mother or nurse to learn these things from him. It is not as difficult as it sounds. Any intelligent person that is interested can easily master the general principles and carry them out without much difficulty. There is almost never any difficulty with the child. Children accept even the most irksome diets without question and rarely try to overstep their bounds. It is needless to say that no mother or nurse should consider herself competent to treat a case of chronic indigestion in childhood without the advice of a physician. In such cases, moreover, she should be careful to pick out a physician who is willing to give the time and attention necessary for the successful treatment of these cases.

Chapter XVI

RECIPES

CEREAL WATERS

BARLEY WATER

Mix 1 level tablespoonful of Robinson's, 'Brooks', or Mead, Johnson & Company's barley flour with enough cold water to make a paste. Add enough more water to make a pint. Boil for thirty minutes in a double boiler. Add water until it is a pint again. Salt to taste. Strain through two or three thicknesses of cheese-cloth or a fine sieve. What goes through is barley water.

PEARL BARLEY WATER

Wash 1 heaping teaspoonful of pearl barley thoroughly. Drain and add a pint of water. Boil for three hours or until the grains of barley are soft. Add enough water to make it a pint again. Salt to taste. Strain through cheese-cloth or a fine sieve.

RICE FLOUR WATER, WHEAT FLOUR WATER, AND OAT FLOUR WATER

These are made in exactly the same way as barley water, using rice flour, wheat flour, or Robinson's Groats instead of barley flour.

OATMEAL WATER

Add 1 tablespoonful of rolled oats or oatmeal to a pint of water. Boil for three hours or more in a double boiler and add water until it is a pint again. Salt to taste. Strain through cheese-cloth or a fine sieve.

RICE WATER

Wash 1 heaping tablespoonful of rice thoroughly. Drain and add a pint of water and a pinch of salt. Cook in a double boiler for three or four hours or until the grains of rice are soft. Add water from time to time to keep the quantity up to a pint. Strain through cheesecloth or a fine sieve.

TOAST WATER

Thoroughly toast two slices of stale, white bread. Break it up into small pieces in a bowl. Add 8 ounces of boiling water and let it stand for an hour. Strain and salt to taste.

CEREAL JELLIES

Cereal jellies are made in the same way as cereal waters, except that more cereal is used, so that, when cool, it is thick enough to form a jelly. About 3 tablespoonfuls of cereal flour should be used to 1 pint of water.

GRUELS

Flour, tablespoonfuls.	Salt, teaspoonful.	Boiling water.	Milk (scalded).
Barley flour, 1	$\frac{1}{4}$	$\frac{1}{2}$ cup (4 ounces)	$\frac{1}{2}$ cup (4 ounces)
Rice flour, 1	$\frac{1}{4}$	$\frac{1}{2}$ cup (4 ounces)	$\frac{1}{2}$ cup (4 ounces)
Farina, 1	$\frac{1}{4}$	$\frac{1}{2}$ cup (4 ounces)	$\frac{1}{2}$ cup (4 ounces)
Oat flour, 1	$\frac{1}{4}$	$\frac{1}{2}$ cup (4 ounces)	$\frac{1}{2}$ cup (4 ounces)
Cracker crumbs, 2	$\frac{1}{4}$	$\frac{1}{2}$ cup (4 ounces)	$\frac{1}{2}$ cup (4 ounces)

Mix the flour with enough cold water in the top of a double boiler to form a paste. Slowly add enough boiling water, stirring all the time, to make 4 ounces. Boil two or three minutes and then set over the lower part of a double boiler to cook for fifteen minutes, stirring frequently. Add the salt and scalded milk and serve hot. It is not necessary to mix the cracker crumbs with cold

water nor to put them over hot water. It is sufficient to boil them two or three minutes.

CEREALS

Dry cereal, level tablespoonfuls.	Salt, teaspoonful.	Boiling water.	Time, hours.
Oatmeal, 4	$\frac{1}{4}$	1 cup (8 ounces)	3
Rolled oats, 5	$\frac{1}{4}$	1 cup (8 ounces)	1
Hominy, 4	$\frac{1}{4}$	1 cup (8 ounces)	3
Cornmeal, 4	$\frac{1}{4}$	1 cup (8 ounces)	6
Farina, 3	$\frac{1}{4}$	1 cup (8 ounces)	3
Wheatena, 3	$\frac{1}{4}$	1 cup (8 ounces)	3
Cream of wheat, 3	$\frac{1}{4}$	1 cup (8 ounces)	3
Pettijohn, 3	$\frac{1}{4}$	1 cup (8 ounces)	3
Ralston, 3	$\frac{1}{4}$	1 cup (8 ounces)	3

Farina and cream of wheat may be mixed to a paste with cold water and the boiling water added to it.

Patent preparations are prepared according to directions on package. They are usually improved by doubling the given time of cooking.

Add the cereal slowly to water which is boiling hard. Add the salt. Cook over direct heat for ten minutes, then place in a double boiler and cook for the prescribed time. The finer grains, such as farina, wheatena, cream of wheat, and cornmeal, must be stirred constantly at first or they will become lumpy.

It is very important to cook cereals for children very thoroughly. In winter, when coal ranges are used, it is advisable to cook the cereal for breakfast during the evening, starting it while supper is being cooked. Care must be taken not to start the cereal cooking when the fire is nearly out. If gas is used the cooking may be finished in a fireless cooker. The longer the cereal is cooked, the more wholesome it is. It should be served without sugar.

BOILED RICE

Add $\frac{1}{2}$ teaspoonful of salt to a pint of water which is boiling hard. Then add 3 tablespoonfuls of thoroughly washed rice slowly, in order not to check the boiling. Boil for thirty minutes. If necessary, add more boiling water in order to keep the kernels separate. Stir with a fork from time to time to prevent the rice from sticking to the saucepan. Drain in a coarse strainer.

STEAMED RICE

Wash 3 tablespoonfuls of rice in several waters. Add the rice and $\frac{1}{2}$ teaspoonful of salt to a pint of water which is boiling hard in the top of a double boiler. Cook over direct heat for ten minutes, stirring gently with a fork. Then place the upper part of the boiler in the lower part and keep cooking constantly, without stirring, for three hours, when the water should be all absorbed.

CRACKED WHEAT

Add $\frac{3}{4}$ cup of cracked wheat and $1\frac{1}{2}$ teaspoonfuls of salt to 6 cups of water boiling in the top of a double boiler. Cook it over direct heat for one-half hour, then put the upper part of the double boiler in the lower and cook for at least six hours.

PAP

Add one slice of stale bread to slightly salted boiling water. Boil for ten minutes. Strain off the water. Beat the bread up well with a fork and pour a little hot milk over it.

TOAST

DRY TOAST

Cut stale bread in slices $\frac{1}{4}$ inch thick. Cut off the crust. Place in toaster. Dry thoroughly on each side by holding it some distance from the fire or the top of the stove, or dry in the oven. Then hold closer to flame or top of stove and brown thoroughly and evenly on each side. Place on hot plate and serve at once.

Toast which is not thoroughly dried, but which is merely browned or burned on the outside, leaving the inside soft and damp, is most indigestible.

BUTTERED TOAST

Make dry toast, butter as soon as brown, place on hot plate, cover, and serve at once. Never put buttered toast in the oven because the butter is overheated and soaks in.

WATER TOAST

Make dry toast. Dip the slice quickly in a shallow pan of boiling salted water with a skimmer or fork. Butter and serve at once on hot plate.

MILK TOAST

Scald 1 cup of milk and add $\frac{1}{4}$ teaspoonful of salt to it. Pour the hot milk over two slices of hot, dry toast which has been cut in strips. Serve at once in covered dish.

CREAMED TOAST

Make two slices of dry toast. Make one cup of white sauce, using $\frac{3}{4}$ tablespoonful of butter and of flour to $\frac{1}{2}$ cup of milk. Season with salt. Dip the toast quickly in boiling water, put on a hot plate, and pour the sauce

over it. Serve at once. Chicken broth may be substituted for one-half of the milk.

BEEF JUICE

Method I.—Sear $\frac{1}{2}$ pound of beef from the lower part of the round in a hot pan, turning quickly, so that the juice will not run out. Cut it in small pieces and press out the juice with a meat press or a lemon squeezer. Add salt to taste. Skim off the fat. One-half pound of beef makes about 2 ounces of beef juice.

Method II.—Put $\frac{1}{2}$ pound of chopped steak from the lower part of the round in a jar. Pour in enough cold water to cover it and add a pinch of salt. Cover jar and let it stand on ice for six hours, shaking it from time to time. Strain through cheese-cloth.

Beef juice made in this way is less palatable and less nutritious than beef juice made by the first method.

SCRAPED BEEF

Take a small piece of lean beef from the lower part of the round. Sear in hot pan. Split with a sharp knife and scrape off the soft part, using a dull knife or spoon. Season with salt.

BROTHS AND SOUPS

BROTHS

Beef.—Cut 1 pound of beef in small pieces and use $1\frac{1}{2}$ pints of cold water.

Mutton or Lamb.—Free 1 pound of mutton or lamb from all fat and skin. Cut in small pieces. Use 1 quart of cold water.

Chicken.—Clean and disjoint a chicken. Remove the flesh from the bones and cut in small pieces. Pound

the bones until well broken. Use 2 pounds of chicken and 1 quart of water.

Put the prepared meat into a saucepan, add the cold water, bring slowly to the boiling-point. Let it simmer for four hours. Strain into a jar or earthen bowl. When cool, put in ice-box. The fat should be carefully removed with a spoon before it is used. If it cannot all be removed in this way, pass soft paper lightly over the surface of the broth until every particle of fat is absorbed. Add $\frac{1}{4}$ teaspoonful of salt for each cup of broth. Heat carefully, but do not let it boil. Serve in a heated bowl or cup. The flavor may be varied by cooking a few pieces of celery or parsley, 1 teaspoonful of any herb, 1 tablespoonful of any grain, or $\frac{1}{2}$ tablespoonful of tapioca with the meat and water.

BEEF TEA

Cut 1 pound of round steak into small pieces, discarding all the fat. Put it in a glass jar with a pint of cold water and cover tightly. The jar should have a close-fitting band and cover. Put the jar on a trivet, or other support, in a saucepan of water at 140° F., or a little more than lukewarm. Keep at this temperature for two hours. Pour off the liquid, cool, and remove the fat. Season with salt. Serve hot in a cup.

VEAL AND CHICKEN JELLY

Use 2 pounds of fowl prepared as for chicken broth and 1 pound of veal knuckle. The veal knuckle should be well cracked. Put them with 1½ quarts of cold water and let simmer until the amount is reduced to 1½ pints. Strain through cheese-cloth. Season with salt and pour into small molds. When cold, remove the fat,

unmold and serve, or reheat at serving time and serve as broth.

CREAM SOUPS

Cream soups may be made from vegetable pulp, using 1 tablespoonful of cooked peas, potatoes, or asparagus. Add $\frac{1}{2}$ cupful of the water in which the vegetables were cooked and $\frac{1}{2}$ cupful of milk to the pulp. Mix $\frac{1}{2}$ teaspoonful of flour with $\frac{1}{4}$ teaspoonful of butter and a pinch of salt and add to the mixture. Boil several minutes, strain, if necessary, and serve hot.

CARROT SOUP

Scrape 1 pound of carrots and cook in a pint of water for three-quarters of an hour or until soft. Put them through a strainer into a quart of meat broth which has been previously prepared. Salt to taste.

SPINACH SOUP

Wash the spinach thoroughly in at least three or four waters. Boil in as little water as will keep it from burning, stirring frequently. It will take from ten to fifteen minutes to cook it, according to the age of the spinach. Drain and rub through a sieve. Mix 4 tablespoonfuls of the boiled spinach with 1 quart of milk to which $\frac{1}{2}$ tablespoonful of flour and $\frac{1}{2}$ tablespoonful of butter have been added. Salt to taste.

VEGETABLE SOUP

Cut 1 potato, 1 carrot, and 2 stalks of celery into small pieces. Add these, $\frac{1}{4}$ pound of lamb, 1 tablespoonful of pearl barley, and 2 tablespoonfuls of rice to 2 quarts of water. Boil for three hours, cooking down to 1 quart. Salt to taste, and strain before serving.

MACARONI SOUP

Boil $\frac{1}{2}$ pound of macaroni in a pint of water for twenty minutes. Drain and cut in $\frac{1}{2}$ -inch lengths. Boil 1 quart of milk with an ounce of butter and a pinch of salt in a double boiler. Thicken it with 2 tablespoonfuls of barley flour. Then add the macaroni and cook for three-quarters of an hour.

FARINA SOUP

Gradually add 1 heaping tablespoonful of farina to a pint of meat broth, boiling it down to $\frac{1}{2}$ pint in about twenty minutes. Salt to taste.

EGGS

General Principle: As albumin coagulates at 160° F., and as it toughens when boiled, eggs should be cooked below the boiling-point to insure a tender consistency.

CODDLED EGGS

Method I.—Put 1 pint of water in a saucepan. When it boils, remove saucepan to the side of the stove. Put in a washed egg and let it stand for from five to ten minutes according to the consistency desired. The consistency after five minutes is about the same as that of an egg which has been boiled between two and one-half and three minutes.

Method II.—Wash an egg and put in saucepan with 1 pint of cold water. Bring just to the boiling-point. Then remove egg from water.

POACHED EGGS

Break an egg into a shallow pan full of boiling water. Remove the pan to a place on the stove where the water will not boil, and let it stand until the white is coagulated

and a thin film is formed over the yolk. Put a piece of toast on a skimmer, dip it in the hot water to soften it, and put it on a hot plate. Remove the egg from the water with the skimmer and place it on the toast.

SCRAMBLED EGGS

Beat egg slightly, season with salt and pepper, and add 1 tablespoonful of milk. Or beat yolk of the egg slightly, add salt and pepper, and a tablespoonful of milk, and then add the white which has been beaten stiff.

The eggs may be cooked in either one of two ways:

1. Put 1 teaspoonful of butter in a small frying pan; when hot, add the egg mixture. Stir with a spoon on the side of the stove until it is just coagulated. Serve at once, either plain or on toast.

2. Pour the egg mixture into the top part of a small double boiler, put the upper part of the boiler into the lower part, full of hot water, and put on the stove. Stir constantly until coagulated. Add $\frac{1}{2}$ teaspoonful of butter and serve at once, either plain or on toast. Scrambled eggs may also be served on cream toast.

ALBUMIN WATER

Add the white of 1 fresh egg and a pinch of salt to $\frac{1}{2}$ cupful of boiled water. One teaspoonful each of sugar and orange juice may be added if not contraindicated. Barley water may be used instead of plain water.

GREEN VEGETABLES

Asparagus.—Cut off the lower parts of the asparagus stalks as far down as they will snap. Untie the bunch, wash, remove the scales, and retie. Cook in boiling salted water for thirty minutes or until soft. Drain, remove the string, and serve with a little butter sauce.

Spinach and Chard.—Spinach and chard should be carefully picked over, and, after the roots and wilted leaves have been removed, should be washed in several waters to be sure that they are free from all sand. Put into a stew pan, allow to heat gradually, and boil for twenty-five minutes or until tender, in their own juices.

String Beans.—Remove the strings, cut up finely, wash, and cook in boiling water for from one to three hours until tender.

Peas.—Cover the peas with cold water and let them stand one-half hour. Skim off the undeveloped peas which rise to the top of the water. Drain the remaining peas and cook until soft in a small quantity of water.

CARROTS

Wash and scrape thoroughly, cut into small pieces, and cook in a small quantity of salted water until soft.

The green vegetables and carrots should be mashed through a fine sieve or a colander for children under three years of age.

POTATOES

Baked Potato.—Scrub a potato thoroughly. Put in hot oven and bake until soft to pressure. Break skin slightly, so that the steam may escape. Serve at once.

Boiled Potato.—Scrub a potato thoroughly, pare it or not, as desired. In the spring, when potatoes are old, it should be soaked in cold water for two hours. Put in boiling salted water, cover, and boil until soft. This usually takes from twenty to thirty minutes. Drain thoroughly, return saucepan to warm place on stove, and let it stand uncovered until the moisture has escaped.

Riced Potato.—Press a boiled potato through a potato

ricer on to a hot plate or into a baking dish. Put in hot oven to brown.

Mashed Potato.—Mash and boil a potato in the saucepan in which it was cooked with a fork or a wire potato masher. Season to taste with salt and pepper, and add sufficient hot milk to make it of the desired consistency. Beat until light and pile lightly on a hot dish or put into baking dish, brushing the top lightly with a teaspoonful of yolk of egg beaten up with 1 teaspoonful of milk, and put in oven to brown. If desired, fold into the mashed potato, beaten light, $\frac{1}{2}$ the white of an egg, beaten stiff. Put in baking dish and bake in moderate oven until firm to the touch and brown. Serve in the same dish.

Stuffed Potato.—Bake a potato. When done, cut out a square piece from the side. Remove all the inside with a teaspoon, leaving the skin intact. Mash, add salt and pepper to taste, and from 1 to 2 tablespoonfuls of hot milk. Beat until smooth and creamy, then add $\frac{1}{2}$ the white of an egg, beaten very stiff. Refill the potato skin, heaping the potato at the opening. Return to oven to brown.

Creamed Potato.—Cut a hot boiled potato into cubes. Add $\frac{2}{3}$ of a cup of the potato cubes to $\frac{1}{2}$ cup of white sauce, mixing lightly with a fork to avoid breaking the potato. The white sauce is made with $\frac{3}{4}$ tablespoonful of butter and of flour, to $\frac{1}{2}$ cup of milk. Creamed potato may be sprinkled with chopped parsley and should be served in a hot dish.

DESSERTS

JUNKET

Warm 1 cup of milk to body temperature or about 100° F. Add a few grains of salt, 1 teaspoonful of sugar, and a few drops of vanilla.

Then stir into the mixture very gently 1 teaspoonful of liquid rennet or essence of pepsin or $\frac{1}{2}$ of a junket tablet, which has been dissolved in a teaspoonful of cold water. Let it stand in a warm place until it is firm. Then put on the ice.

RICE PUDDING

Pick over and wash 1 tablespoonful of rice and let it stand in a little cold water for several hours. Mix the rice, 2 level teaspoonfuls of sugar and a few grains of salt, and $1\frac{1}{4}$ cups of milk together. Pour into a buttered bowl and bake in a slow oven one and one-quarter hours. Stir occasionally.

BAKED CUSTARD

Beat 1 egg slightly. Add 2 level teaspoonfuls of sugar, a small pinch of salt, and a few drops of vanilla. Then gradually add $\frac{2}{3}$ cupful of scalded milk, stirring all the time. Pour into small, buttered cups. Set the cups in a pan of hot water and bake in a moderate oven until firm.

TAPIOCA CUSTARD

Mix 3 tablespoonfuls of minute tapioca with $\frac{1}{4}$ cup of sugar and $\frac{1}{2}$ teaspoonful of salt. Add slowly to 2 cups of scalded milk and cook fifteen minutes. Beat the yolks and whites of 2 eggs separately. Stir them slowly into this mixture and bake twenty minutes in a slow oven.

SAGO PUDDING

Cook $1\frac{3}{4}$ ounces of well-washed white sago in a pint of milk, stirring often to prevent burning. When the sago becomes tender, place it in a dish to cool. Add $1\frac{1}{4}$ ounces of butter, and stir until it froths. Then add

the yolks of 2 eggs, one after the other, adding also 1 teaspoonful of sugar after each yolk, then whip the whites of the eggs and stir them in. Bake in a buttered dish with moderate heat for three-quarters of an hour.

RICE MILK

Soak 1 ounce of thoroughly washed rice in cold water for twelve hours. Strain off the water and add 1 pint of scalded milk, $\frac{1}{2}$ teaspoonful of salt, and 1 tablespoonful of sugar to the rice. Stir well and cook for one hour. Rub through a fine sieve. Dilute with milk if desired. Sago and tapioca may be used in the same way.

BREAD PUDDING

Remove the crust from 2 slices of stale baker's bread. Cut $\frac{1}{8}$ inch thick. Break up the bread into small pieces. Add $\frac{2}{3}$ cup of milk, 1 tablespoonful of sugar, $\frac{1}{2}$ tablespoonful of melted butter, $\frac{1}{2}$ of a beaten egg, and a few grains of salt. Bake in a small buttered dish in a moderate oven.

TAPIOCA CREAM

Add $\frac{3}{4}$ tablespoonful of minute tapioca to $\frac{1}{2}$ cup of scalded milk. Cook in a double boiler until the tapioca is transparent. Then add 1 tablespoonful of sugar.

As soon as this is dissolved, pour the hot mixture slowly on to a tablespoonful of sugar mixed with a few grains of salt and the yolk of an egg, slightly beaten. Return to double boiler and cook until the mixture thickens. Then add the white of the egg, beaten stiff. Chill and add $\frac{1}{4}$ teaspoonful of vanilla.

APPLE TAPIOCA

Mix 2 tablespoonfuls of minute tapioca with $\frac{1}{8}$ teaspoonful of salt, and add to $\frac{2}{3}$ cup of boiling water.

Boil for two minutes. Then steam in a double boiler for fifteen minutes. Pare and core an apple and cut it in eighths. Butter an individual baking dish, cover the bottom of the dish with tapioca, spread over it four of the pieces of the apple and sprinkle them with $\frac{1}{2}$ tablespoonful of sugar. Repeat. Cover with the rest of the tapioca. Bake in a moderate oven until the apple is soft.

CORNSTARCH PUDDING

Mix $1\frac{1}{2}$ tablespoonfuls of cornstarch, $\frac{1}{2}$ tablespoonful of sugar, and $\frac{1}{3}$ teaspoonful of salt with 2 tablespoonfuls of cold milk. Add gradually to $\frac{2}{3}$ cup of scalded milk, stirring well until the mixture thickens. Cover and let cook in a double boiler for eight minutes. Then add an egg, slightly beaten, and cook for one minute. It may be served hot with milk or molded and jellied. A little vanilla may be added when it is cooking if desired.

GELATIN

Soak $\frac{1}{4}$ envelope of gelatin in a little cold water for five minutes and dissolve with $1\frac{1}{2}$ cups of boiling water. Add 2 tablespoonfuls of sugar and stir until it is dissolved. When cool, add a few drops of vanilla. The juice of an orange or lemon may be used in place of the vanilla. If so, it will be necessary to add more sugar. Strain through a wet cheese-cloth or fine strainer into a cold, wet mold. Place in a cold place to cool.

FRUITS

BAKED APPLES

Wash and core the apples. Put $1\frac{1}{2}$ teaspoonfuls of sugar in the cavity of each apple and a little boiling water in the pan. Bake in a hot oven, basting with the syrup.

APPLE SAUCE

Wipe, pare, core, and quarter cooking apples. Put them into a saucepan, allowing 1 teaspoonful of sugar for each apple. Add enough water to cover them. Cook until soft and strain.

APPLE COMPOTE

Pare and core an apple. Put in a saucepan of boiling water and boil it until it is soft, but not broken. Remove it with a skimmer. To one-half of the water add 2 table-spoonfuls of sugar and boil until it is reduced to 2 table-spoonfuls. Cut out a round piece of bread and dip it in the syrup. Place the apple on this and fill the cavity in the apple with some bright colored jelly. Pour a table-spoonful of syrup around it. Serve with milk.

BAKED PEARS

Pare and core a pear. Put it in a small, stone crock. Fill the cavity with sugar and pour in water to the depth of 2 inches. Cover the crock and put in a very slow oven to cook for several hours until the fruit is perfectly soft, but has not lost its shape. Remove to plate, pour syrup from the crock over it, and serve cold.

STEWED PEARS

Pare and quarter the pears. Remove the seeds and fibrous pieces. Cover with cold water and stew until soft. Add the necessary amount of sugar and boil for two minutes longer. Flavor with lemon juice.

BAKED BANANA

Wipe a banana and loosen one section of the skin. Then replace it. Put in shallow pan, cover, and bake

until the skin is very dark. The banana should then be soft. Remove it from the skin and serve at once.

BOILED BANANA

Select a ripe banana with an unbroken skin. Partly cover it with boiling water in a saucepan and boil fifteen minutes. Remove the skin and woody fiber. Add a little milk and beat to a fine pulp.

STEWED PRUNES

Select large prunes. Wash them, and soak them over night in cold water. Cook slowly in the same water until tender. Do not add any sugar or sweetening.

PRUNE JELLY

Wash 5 prunes and soak in water for an hour or more. Boil the prunes in the water in which they have been soaked and cook until the stones will slip out easily. Remove the stones. Add $1\frac{1}{2}$ tablespoonfuls of sugar and 4 tablespoonfuls of the water in which the prunes have been cooked to the prunes and put over the fire again. Soak 1 teaspoonful of gelatin in a tablespoonful of cold water. When the prunes and sugar have come to the boiling-point again, add the gelatin and stir. Pour into a mold. When set, unmold and serve with or without milk.

PRUNE WHIP

Wash $\frac{1}{4}$ pound of prunes and soak over night in enough cold water to cover them. In the morning cook in the same water until they are soft. Remove the stones and press the prunes through a sieve. Add $\frac{1}{4}$ cup of sugar and cook until they are of the consistency of marmalade. Beat the white of an egg very stiff and add 3 tablepoon-

fuls of the prune mixture and $\frac{1}{4}$ tablespoonful of lemon juice. Pile the mixture lightly on a baking dish and bake in a moderate oven for twenty minutes or until firm to the touch. Serve hot or cold.

SPECIAL PREPARATIONS OF MILK

WHEY

Heat 1 quart fat-free or skimmed milk until it is lukewarm, or to 100° F. Add 2 junket tablets, broken up and dissolved in a tablespoonful of cold water, or 2 teaspoonfuls of liquid rennet or essence of pepsin. Stir this enough to mix. Let it stand until it is firmly jellied. Break up the curd with a knife or fork. Strain through several thicknesses of cheese-cloth or through linen. What goes through is whey. If the whey is to be mixed with any form of milk or cream it must be heated to 150° F. in order to destroy the ferment. If it is not, it will make curds and whey of the milk and cream.

PEPTONIZED MILK

Dissolve the contents of a "peptonizing tube" in 4 ounces of warm water. Add this to 24 ounces of milk in a glass jar with a cover and shake well. Set the jar in a dish of water at the temperature of 115° F., and keep it there for ten minutes. Place immediately on the ice and keep it there. If further digestion is desired, it may be kept at 115° F. for a longer time. If it is kept hot too long it becomes bitter.

LACTIC ACID MILK

Add a tube of lactic acid bacillus culture or a well-pulverized lactic acid bacillus tablet to a quart of fat-free or skimmed milk. Stir well. Allow the milk to stand

in a warm place over night, the exact temperature not being essential. A little experimentation will show how long it is necessary for the milk to stand in a given place to cause souring in the milk, with a fine precipitation of the casein, without separation of the curd from the whey. When this point is reached, the milk is bottled and put on the ice. If it is allowed to stand too long or is allowed to get warm again, it will become too sour and the curd will separate from the whey. An ounce of each day's milk may be used to ferment the milk for the next day. It is usually possible to make lactic acid milk for a month before starting with a fresh culture again.

PROTEIN MILK

Heat 1 quart of fat-free or skimmed milk until it is lukewarm, or to 100° F. Add 2 junket tablets, broken up and dissolved in a tablespoonful of cold water, or 2 teaspoonfuls of liquid rennet or essence of pepsin. Stir this enough to mix. Let it stand until it is firmly jellied. Break up the curd with a knife or fork, strain off the whey through several thicknesses of cheese-cloth, then rub the curd through a fine, wire sieve with a spoon or potato masher into a pint of lactic acid milk made from fat-free or skimmed milk. Add water to make the amount of the mixture 1 quart. It is essential that the curd be in a very finely divided form, and in order to have it so it is usually necessary to rub it through a sieve several times.

SECTION III

GROWTH AND DEVELOPMENT

Chapter XVII

NORMAL DEVELOPMENT

WEIGHT

Weight at Birth.—The average full-term baby weighs between 7 and $7\frac{1}{2}$ pounds at birth. Girls are likely to weigh a few ounces less than boys. During the first few days after birth there is always a loss of from 5 to 12 ounces, and the birth weight is usually not regained until the baby is about two weeks old. If the baby is entirely bottle fed the birth weight may not be regained until somewhat later than this.

Scales.—An accurate pair of scales with which to weigh the baby is one of the most important articles of the baby's outfit. There are two types of scales which are commonly used: (1) A spring scale with a dial and pointer which registers the weight. This is not at all accurate, and should never be bought if it is possible to secure the other kind. (2) Balance scales, which are much preferable. In the last few years a number of very satisfactory scales, made especially for weighing babies, which are similar to the accompanying photograph, have been put on the market, and, if they can be afforded, such scales should always be obtained. Equally good, although not quite so finely made, is the old-fashioned balance scale with a large scoop, which was formerly used

in many households for weighing groceries. If there is in the house a pair of ordinary bath-room scales, which will weigh in ounces, these are satisfactory, and a small basket may be obtained to put the baby in when it is being weighed. The weight of the basket is then, of course, subtracted from the weight shown on the scales in order to get the baby's weight.

Importance of Weighing.—It is very important during the first year that the baby should be weighed frequently and a record of the weight kept, as steady and satisfactory gain in weight is one of the best signs there is that the baby is doing well, while too slow a gain or a loss indicates that something is wrong.

Frequency of Weighing.—The weight should be taken daily during the first few weeks. The baby must not be expected to gain the same amount each day; one day it may gain 2 ounces, the next day none, the next day 1, and so on, but after the first few days the general trend should be upward. After the baby is two weeks old it should not be weighed oftener than once a week, as there is no particular object in frequent weighing, and, when babies are weighed daily, many nervous mothers are much worried if the baby does not gain every day, which no baby ever does. We do not like to have the infants under our care weighed more often than once a week, except in rare cases for special purposes, nor do we approve of the practice of plotting the baby's weight against a theoretic normal curve, as so many mothers do. There is no such thing as a normal curve. Different babies vary too much.

Gain in Weight.—Just as one adult may be larger and heavier than another, so may one baby be larger and heavier than another. A baby whose parents are small or a baby who weighed 5 pounds when born, cannot be ex-



FIG. 10.—THE "PERFECTION" SCALE.
(Courtesy of Jacobs Brothers.)

pected to weigh as much as one whose parents are large or who weighed 9 pounds when born. A comparison of babies' weights is always made when a number of mothers get together, and the mother whose baby does not weigh quite as much as someone else's does is very likely to worry, usually without cause. She must remember that there are many circumstances which control weight, such as heredity and weight at birth, and that, if her baby is healthy and is making steady gains each week, she need not worry if it does not weigh quite as much as some other woman's baby of the same age. Indeed, the fat baby is not always the healthy baby, and in some instances, while the scales seem to indicate that a baby is thriving, such may be by no means the case, for not a few infants whose weight is quite satisfactory may have a very soft, flabby flesh, and may, in reality, be anemic and in poor condition. Babies who are fed on condensed milk are not infrequently of this type. A firm, solid, elastic condition of the flesh is an extremely important sign of the nutritional state of a baby, and, indeed, we should put it before the weight as a criterion of whether the baby's nutrition is proceeding satisfactorily or not. This hard, firm flesh is particularly noticeable in the legs and buttocks.

Amount of Gain Per Week.—The average baby during the first five months should make an average gain of from 6 to 8 ounces a week. The gain is never as rapid during the rest of the first year, and a weekly average of from 4 to 6 ounces is satisfactory. The gain each week is hardly ever the same, especially in bottle-fed babies. One week it may be 3 ounces, and the next week 11 ounces, which makes a good average for the two weeks. A small gain or a lack of gain for one week need cause no worry; if it continues for two or three weeks, some-

thing is wrong. A cold in the head will usually prevent the baby from gaining, because it does not eat as much during this time. Almost every baby, moreover, has periods of slight indisposition, when, for a short time, there will be only a slight gain or none at all. No baby ever makes large gains regularly each week, and the mother must not expect her baby to do so.

Weight at Different Ages.—The average baby will usually double its birth weight at five months and treble it in a year. Many apparently normal babies do not, however, treble their birth weight before they are fifteen months old.

WEIGHT AND HEIGHT FROM ONE TO SIX YEARS

It must be repeated that, for many reasons, averages may be misleading, and that a child of a given age may vary in weight or height one way or the other from the average and still be normal. Children of tall parents are naturally tall, children of short parents are likely to be short. A certain type of child is naturally tall and slender and may fall considerably below the average weight for its height and still be normal. In general, however, the best index of normal nutrition is the relation of weight to height, irrespective of age. Either weight or height *alone* for a given age are almost always misleading.

There are many tables in use for the height and weight of American children, all of which vary somewhat. The tables below have been compiled from Crum's report in the Quarterly Publication of the American Statistical Association for 1916 and from the tables used by the Nutrition Clinics for Delicate Children.

TABLE IX

AVERAGE HEIGHTS AND WEIGHTS AT VARIOUS AGES

<i>Boys</i> ¹			<i>Girls</i> ¹	
Height, inches.	Weight, pounds.	Age.	Height, inches.	Weight, pounds.
20.6	7.6	At birth	20.5	7.2
29.4	21.4	1 year	28.9	20.8
31.8	24.6	18 months	31.1	23.4
33.8	27.1	2 years	33.4	26.4
35.4	28.5	2½ years	34.9	28.3
37.1	32.3	3 years	36.8	30.5
37.5	32.4	3 years, 2 months	37.0	31.0
38.5	33.5	3 years, 4 months	37.5	32.0
38.6	33.8	3 years, 6 months	38.0	32.5
38.9	34.3	3 years, 8 months	38.5	33.0
39.0	34.8	3 years, 10 months	38.8	33.5
39.5	35.9	4 years	39.0	33.8
39.9	37.9	4 years, 2 months	39.7	36.8
40.2	38.5	4 years, 4 months	40.0	37.4
40.6	39.2	4 years, 6 months	40.4	38.0
41.0	39.8	4 years, 8 months	40.7	38.6
41.4	40.5	4 years, 10 months	41.0	39.2
41.7	41.2	5 years	41.3	39.8
42.1	41.8	5 years, 2 months	41.6	40.4
42.4	42.4	5 years, 4 months	41.9	41.0
42.8	43.1	5 years, 6 months	42.3	41.6
43.2	43.8	5 years, 8 months	42.6	42.2
43.5	44.5	5 years, 10 months	42.9	42.8
43.9	45.2	6 years	43.3	43.4

¹ Up to and including four years the weights are without clothes. After this the weight of the clothes is included. From four to six years the clothes weigh about 3 pounds.

TABLE X

AVERAGE WEIGHTS AT VARIOUS HEIGHTS

Height, inches.	<i>Boys</i>	<i>Girls</i>
	Average weight for height, pounds.	Average weight for height, pounds.
33	25.9 ¹	26.0 ¹
34	27.3 ¹	27.3 ¹
35	28.7 ¹	28.6 ¹
36	30.0 ¹	30.0 ¹
37	31.6 ¹	31.5 ¹
38	33.2 ¹	32.7 ¹
39	36.3	35.7
40	38.1	37.4
41	39.8	39.2
42	41.7	41.2
43	43.5	43.1
44	45.4	44.8
45	47.1	46.3

¹ Without clothes.

Chapter XVIII

MALNUTRITION

THERE has been a steady increase in the general interest in malnutrition in children during the last decade which was accentuated by the discovery, during the World War, that a very large proportion of our young men were in poor physical condition and unfit for military service. The routine examinations of school children have shown that evidences of malnutrition are as common in them as in young adults. On account of this marked prevalence of malnutrition, steps are now being taken all over the country to overcome it. Too much attention is being paid in this campaign, however, to arbitrary standards of height and weight, and too little to other evidences of malnutrition. Furthermore, in many instances the decision as to whether a child is malnourished or not is left to some person incompetent to make it.

Malnutrition is shown not only by failure to gain properly in height and weight, but in many other ways also. In fact, a child may show many evidences of malnutrition and yet be normal as regards height and weight. The other common manifestations of malnutrition are flabby muscles, dry skin and hair, brittle nails, round shoulders, and circles about the eyes. Still other manifestations, on the side of the nervous system, are irritability, inattention, poor progress at school, and restlessness and sleeplessness at night. Undue fatigue, both physical and mental, is also a common symptom of malnutrition.

It is very difficult, if not impossible, to set up any arbitrary standard for height and weight at given ages. How difficult this is is shown by the number of different tables which are in use. Whatever standard is adopted, it must not be thought of as representing the normal, because it does not. It merely represents the average. There are two main types of individuals, the tall and slim, and the short and thick, with many variations. Both types are normal. The tables merely show the average of these types. No one should, therefore, be expected to conform to the table. Furthermore, some families are normally short, and others tall. The children of the short families will therefore fall below the average, and those of the tall will be above it, yet both will be normal. Breeders do not attempt or expect to raise cart horses from racers or racers from cart horses. Why should it be thought that the situation is any different with mankind? If, therefore, a child is well, there is no occasion for worry because it is somewhat below or above the height and weight given for its age in these tables of averages. In general, it may be said, however, that if a child is more than 7 per cent. below or 20 per cent. above these figures, it is advisable to have it carefully looked over in order to make sure that there is nothing wrong. These tables, moreover, having been compiled from the measurements of children of all races and classes of society and including all children, both the well-nourished and the malnourished, give figures which are somewhat lower than the true average of the normal, well-nourished child. The children of well-to-do American parents are usually both taller and heavier than the figures given in these tables. People must learn to accept their children as they are and not to compare them with their neighbors. They do not expect

all the men and women in a block or town to be of the same height and weight, to have the same colored hair, eyes, and skin. There is no more reason for them to expect that their children will all be just alike.

Causes of Malnutrition.—If a child is below the height and weight which it, individually, might have been expected to reach at its age, or shows other signs of malnutrition, every detail of its life should be investigated and a careful physical examination made in order to determine the cause of the malnutrition. Incidentally, one of the best ways to prevent the development of malnutrition is to have a child carefully examined every year or, better, every six months by a competent physician. The signs of beginning trouble will often be detected in this way, and, having been discovered early, the development of real malnutrition can be prevented. It is evident that unless the cause of the malnutrition is found, it cannot be removed, and that the removal of the cause is the first step to be taken in treatment. No treatment will avail unless the cause is removed. The causes of malnutrition in childhood may be divided into three main classes: Physical, social, and dietetic.

Physical.—The physical causes of malnutrition are diseases and various malformations. Tuberculosis, contrary to the common belief, is relatively seldom the cause of malnutrition in early childhood. Chronic disease of the tonsils or of the sinuses connected with the nose are the most common of the diseases causing malnutrition in childhood. Pyelitis is also sometimes a cause. Decaying teeth often cause malnutrition, partly by interfering with proper mastication and partly by the poisons which are produced in them and absorbed into the system. Adenoids and deformities of the jaw and nose which interfere with proper respiration are the

most common of the malformations which produce malnutrition. The remedies are obvious: removal of diseased tonsils and teeth and of the adenoids, treatment of the sinuses and pyelitis, and correction of the deformities.

Social.—Among the causes classified as social are, in the first place, an insufficient amount of fresh air and sunlight and too hot or too cold houses. More important, however, are physical and mental overfatigue. Physical overfatigue is usually due to too much and too hard play, often in association with insufficient sleep. Naps and rests are given up too soon and the child does not go to bed early enough. Lack of sleep may also be due to excitement or improper food. Mental overfatigue in young children is not often due to too much study. It is the result of neglect at home, friction in the family, unsuitable books and stories, too much excitement, too many parties, going to the movies, long automobile rides, and similar amusements improper for young children. The remedy is, of course, a simple, rational, not too strenuous life, without undue excitement, and with plenty of fresh air and sunshine.

Dietetic.—Malnutrition is more often due to improper food than to the lack of food. A child, while apparently getting enough to eat, may be, however, really not getting a diet which provides sufficient nourishment or one which is deficient in some of the essential food elements or accessory food factors. More often, however, the food provides sufficient nourishment and contains a sufficient amount of all the food elements and vitamins, but is unsuitable in character and has caused indigestion. When malnutrition is due to some dietetic error, careful analysis of the diet will show whether there is any deficiency in the food or whether it is simply improper

and the cause of indigestion. The treatment of indigestion has already been described. The food requirements of the average child, as recently determined by Holt, are given briefly below. If these requirements are met, the child will not develop malnutrition from the lack of anything in its food, and will recover from it if something has been lacking in the past. These figures are given simply to show the general principles to be followed in solving the problem of the nutrition of young children. They cannot be followed, of course, without tables of the caloric value and content of the food elements in the various foods. These are not given because problems of this sort belong to the physician rather than to mothers and nurses.

Caloric Requirements.—The caloric requirements of babies at one year are about 950, and of children of six years 1600 calories daily. These figures mean about 45 calories per pound at one year, and 35 calories per pound at six years. Girls require a little less than boys. Active children and those that are underweight require more than quiet and well-nourished children.

The Balanced Diet.—The average normal child gets 35 per cent. of its caloric intake in the form of fat, 50 per cent. in the form of carbohydrates, and 15 per cent. in the form of protein. This relation of the different food elements is probably the most suitable one.

Protein Needs.—During the first year the protein need is approximately 1.9 grams per pound, and during the sixth year 1.2 grams per pound. These figures mean about 45 grams daily during the second, and 60 grams daily during the sixth year. Vegetable protein is not as efficient as animal protein. It has been found that children, as a rule, take about two-thirds of their protein in the form of animal, and one-third in the form of vege-

table protein. The protein of cow's milk is not as efficient for babies as that of human milk. Therefore, they need more of it in order to thrive.

Fat Needs.—A baby gets about 1.8 grams of fat per pound of weight in breast milk and needs the same amount on artificial food. At six years the child needs 1.4 grams of fat per pound of body weight. The baby needs 36 grams of fat daily during its first and 49 grams during its second year. The child needs 63 grams of fat when it is six years old.

Accessory Food Factors or Vitamins.—It has already been stated that it is not necessary to think about the vitamins when children are taking a reasonable amount of milk and eating an ordinary American diet. It is well to know, however, that the fat-soluble A vitamin is most abundant in milk, butter, yolk of eggs, and the green leaves of vegetables. It is abundant in cod-liver oil and in the fat of meats. There is none of it in the fats obtained from vegetables, such as olive oil and cotton-seed oil. This vitamin is practically unaffected by cooking. How much fat is necessary to supply an adequate amount of this vitamin is not known, but the amount is very small.

The water-soluble B vitamin is abundant in meat, eggs, and milk, in the seeds of plants, such as beans and peas, in the cereal grains, if they are not milled, and in many vegetables and fruits. This vitamin is weakened to a certain extent by the temperatures ordinarily reached in cooking. It is very abundant in yeast, but it is entirely unnecessary for a child to take yeast if it is eating milk, eggs, meat, vegetables, or fruits.

The antiscorbutic vitamin C is present in many vegetables and fruits, also to a certain extent in milk and meat. It is nearly or entirely destroyed at the tempera-

tures ordinarily used in cooking. It need not be thought of except in infancy, and then a sufficient supply is easily provided by giving a small amount of orange juice, lemon juice, or tomato juice.

Summary.—Malnutrition is a common condition in childhood. A child may be small and yet not be suffering from malnutrition. There are other evidences of malnutrition besides failure to gain in weight and height. There is always a definite cause for malnutrition. If this cause is properly sought for, it can always be discovered and removed. When it is discovered and removed, recovery is usually rapid. Parents must remember, however, that they have no reason to expect their children to be made of any better material or to be any more resistant than they are themselves. If they are delicate, the tendency in their children is also to be delicate, and it is harder to build up their nutrition than that of the children of stronger parents.

Chapter XIX

DEVELOPMENT OF SPECIAL ORGANS, SENSES, AND FACULTIES

The **head** is relatively large at birth, its circumference being greater than that of the chest. At one year the head and chest are about equal in circumference. There is almost always some asymmetry of the head for the first few weeks, owing to compression during labor. This soon disappears. A baby can usually hold up its head alone, if the back is supported, at about three months. The soft place which all babies have on the top of the head is called the **fontanel**. This should be closed between the sixteenth and eighteenth month.

The Hair.—The amount of hair with which babies are born varies greatly. Some newborn babies are almost bald, while others are born with a luxuriant growth of thick hair. It is usually lost during the first few months, and is replaced by a new growth.

Sight.—A baby probably does not see very well for the first few weeks of its life, and during this time a strong light may cause discomfort. Therefore no baby during the first few weeks should be exposed to a bright light. The color of the eyes in most newborn babies is blue, which changes to the permanent color as the baby grows older. Up to the age of three months, babies may not normally be able to fix their eyes. It is, therefore, not abnormal for a young baby to be cross-eyed. If the squint persists after the fourth month, it is probably abnormal. A baby will usually recognize objects at about the third or fourth month.

Hearing.—Infants hear little or nothing during the first few days of life, but the hearing in a few days becomes good. Infants vary a great deal in their susceptibility to noise. Some are easily startled and may be even considerably disturbed by relatively slight noises, while others do not apparently mind noise at all.

Smell.—It is probable that a small baby has a very poor sense of smell.

Taste.—The sense of taste is developed at birth, but it does not seem as though very young babies have as acute a sense of taste as older ones, for a young baby will readily take almost any kind of food, no matter how peculiar its taste may be (buttermilk, etc.). An older infant will often refuse a food which tastes differently from one to which it has been accustomed.

The Teeth.—Babies vary greatly in the time at which they cut their teeth. Babies are sometimes born with teeth, and we have seen a baby of four months who had already cut 3 teeth, and a perfectly normal baby of thirteen months with none. In general, the first tooth is usually cut at six or seven months, and although there is great variation in the order in which they come, they are likely to appear about as follows:

- | | |
|-------------------|---|
| 6-10 months..... | 2 middle lower incisors (these are usually the first ones); |
| | 4 upper incisors. |
| 12-15 months..... | 2 lateral lower incisors and 4 anterior molars. |
| 18-20 months..... | 4 canines ("eye" and "stomach" teeth). |
| 24-30 months..... | 4 posterior molars. |

The average child should then, at the age of about two and a half years, have completed the first dentition, and should have a set of 20 "baby teeth." During the

sixth year the first permanent molars appear behind the temporary teeth, and soon after the permanent teeth begin to replace the temporary set.

Teething.—Practically every baby, from the age of six months to two and a half years, is cutting teeth continuously. It is, therefore, the custom among mothers, and especially among grandmothers, to blame "teething" for every disturbance the baby may have during this period. As a matter of fact, most babies cut their teeth without any trouble. Perhaps 10 per cent. may be made somewhat fussy and may lose their appetites temporarily, while only a very, very small number are made really sick by teething. It can be said most emphatically, therefore, that the general conception that teething is likely to cause all sorts of disturbances in a baby is without foundation. It is undoubtedly true, however, that in a few cases teething may be difficult and that the gum over the erupting tooth may be much swollen, hot, and tender. It is probably not possible for a tooth to disturb a baby to any extent unless the gum is in this condition. In such cases the baby may be considerably upset and may be feverish for several days, the symptoms subsiding as soon as the tooth comes through. The mother can do nothing to help her baby cut its teeth. Rubbing with paregoric does no good, as paregoric has no local anesthetic action whatever. It may do harm, moreover, as the baby may swallow enough of the paregoric to stupefy it. In a few instances it may be necessary for the doctor to lance the gum in order to let the tooth come through. This is, however, rarely necessary.

Care of the Teeth.—Brushing the teeth with a soft brush should be begun as soon as there are any teeth to brush. It is not necessary to use tooth-paste until there are several teeth. Any one of the standard pastes may

then be used. It is vitally important to begin to care for the teeth at once, as decay often starts at a very early age. Every child should be taken to the dentist as soon as it is three years old, or earlier, if necessary, and thereafter every six months, in order that the teeth may be examined and any cavities which may have developed filled while they are still small. It is often said that it is not desirable to fill the temporary teeth. This is incorrect. The temporary teeth should have just as much attention as the permanent ones. In certain children, despite painstaking care, greenish stains may develop on the teeth. These are very hard to get rid of, and the best thing to do with children who have this tendency is to take them to the dentist often enough to keep the teeth clean. If the child is old enough washing the mouth out after each meal with a teaspoonful of milk of magnesia in a little water may help somewhat in preventing the development of these stains.

Sitting Up.—The average normal baby is usually able to sit up without support when it is seven or eight months old. It is not advisable to force a baby to sit up. It will do it by itself when it is strong enough. When the baby first begins to sit up by itself, the back should be well supported by pillows, and it should not be left for any length of time strapped into a high chair. Babies normally sit with a straight back. When they sit with a general backward curve to the spine it means that the muscles of the back are weak and that sitting up should not be encouraged.

Walking.—The average baby can stand with support at about a year and without support at about fourteen months. It walks alone about a month later. Some babies stand and walk earlier, however, and others, that are apparently normal in every way, do not until

some months later. Some babies go through the creeping stage before they begin to walk or stand, some do not. Some babies never creep, but get about by very peculiar methods of their own, such as hitching along in a sitting position. A child should never be urged to walk, but should be left alone to learn it for itself. We do not believe in the various devices sold under the name of "walkers" or "baby tenders."

Delay in walking may be due to a number of causes: (1) If a baby has had a difficult time with its food during the first year, it will probably be late in learning to walk; (2) If a baby has an acute sickness of any sort when it is just beginning to learn to walk this will probably set it back for a time; (3) Weak ankles are a very common cause of delay and awkwardness in walking. In this condition the ankle is bent inward, so that the child walks on the inner side of the foot. In addition, the feet are usually flat. Much may be done by proper treatment to relieve weak ankles and flat-feet and to improve the gait. The usual treatment is to build up the inside sole of the shoe so that the weight is thrown more to the outside of the foot, and also to fit the shoes with light inside steel braces in order to give support to the ankles. (4) Some children are late in walking because they are very heavy or are naturally timid.

Bow-legs.—The muscles on the inside of a young baby's lower leg are small and not prominent. Those on the outside are large and prominent. In fat babies especially this gives a somewhat curved appearance to the lower legs, which the mother often mistakes for bow-legs. Bowing of the legs as the result of rickets is not very uncommon, but it seldom develops before babies are nine months old.

Development of the Faculties.—The baby smiles when

it is about six weeks old, and laughs when it is about six months old. It notices objects at about eight weeks and probably recognizes people when it is about three months old. It reaches out and grasps objects when it is about four months old. It says single words at about a year, and can usually form short sentences by the end of the second year.

CONTROL OF BOWEL MOVEMENTS AND URINE

It is well, as soon as the baby is about six months old, to attempt to train it to pass its stool on a chamber at a regular time each day. In our opinion it is not possible or desirable to attempt to train a baby to stool before this time. Observation is made of the time about at which the baby is in the habit of having a movement, and it is then placed each day at this time or times on a small chamber, with the back well supported by the mother's hand, and a suppository is used, which should soon result in a stool. After the first few days it will not be necessary to use a suppository, and nearly every time that the baby is put on the chamber it will have a stool. It is, of course, not possible to train a baby as young as this so that it will never pass a stool in its diaper; the best that can be expected is that it will pass most of its stools in the chamber. When the baby is eighteen months old it should rarely dirty itself, and never when two years old.

Babies always pass urine very frequently, and it is therefore not easy to train them to keep dry, but the average baby should be able to control its urine during the day at two years of age.

SECTION IV

CARE AND TRAINING

Chapter XX

SLEEP, REST, EXERCISE, AND FRESH AIR

SLEEP

THE small infant sleeps a great deal; as it grows older it sleeps less and less. The following table shows the average time that babies and children of different ages may be expected to sleep during the twenty-four hours:

First month—20 hours.
One to six months—16 hours.
Six to twelve months—15 hours.
One to two years—14 hours.
Two to five years—11 to 14 hours.

The variation in individual instances is great. Many children after the first year sleep very little in the daytime, while some children of three or four years always sleep during the daily rest. Others do occasionally, some never. It is well during the first few weeks to accustom the baby to noises; there is no need of tiptoeing about the house—let the baby adapt itself to conditions. It is also best to accustom the baby to going to sleep in a dark room. If this is done it will not be afraid of the dark as it grows older.

Practically all babies and young children kick about a good deal during sleep, and care must be taken that

they do not catch cold. For babies under six months of age small flannel blankets, about a yard square, may be used as swathes. One of these is wrapped about the baby with the arms inside and then snugly pinned. If the baby becomes accustomed to this early it does not mind having the arms pinned in. For older babies and young children the bed blankets should be tightly pinned down with large horse-blanket pins.

Poor sleeping at night may be due to a number of different causes. Some of the common causes are as follows: (1) Indigestion; (2) hunger; (3) adenoids; (4) wet diapers; (5) too warm clothing; (6) a flapping window shade or loose window blind; (7) poor training (see chapter on Training). The mother is able to cope with the last four causes; for the first three the doctor should be called.

DAILY REST

A baby under one year of age is in bed the greater part of the time. As they get older and begin to creep and walk they should continue to spend part of both morning and afternoon in bed. At about two years, when they are walking well and are beginning to get about a good deal, they are up and around most of the day, but are put to bed for a rest, and usually to sleep, for about two hours, either before or after the midday meal, according to the convenience of the household.

The daily rest is one of the most important institutions of the child's life. It should under no circumstances be omitted until school age is reached. If the child has been accustomed to it right along, it is taken as a matter of course; if it is taken only occasionally, it becomes harder and harder to carry out. After the second year many children do not sleep during the rest, but they should have their shoes and upper garments removed

and be put to bed in a darkened room, and kept there, whether they like it or not, without any toys or books. Some children occasionally sleep during the rest period right up to school age.

The reason that the daily rest is so important is this: In proportion to its size and strength a child lives a much more violent and active life than an adult does; it is continually in motion, continuously in a state of more or less nervous tension, and receiving countless new impressions all the while. It is very easy for a young child to become physically and nervously exhausted, and such exhaustion is one of the most common conditions with which a doctor is called to deal. It may be the cause of many symptoms, and the underlying factor in such conditions as nervousness, malnutrition, and loss of appetite. It can easily be seen, therefore, how extremely important it is for the young child to have each day a period of complete mental and physical relaxation.

EXERCISE

The baby who does not walk gets its exercise by crying and by moving its arms and legs about. It is an excellent plan to have a play and exercise period for the baby. The most convenient time is from five to six in the afternoon. The clothes are taken off, all except the band, and the baby is put on the bed on a blanket in a warm room and allowed to kick and play to its heart's content. It is often surprising to see how much even young babies enjoy this. When the baby begins to creep it should have a pen. One which is raised from the floor is the best sort to get, as there is less chance of the baby's taking cold than if it is put on the floor. It soon begins to get a good deal of exercise pulling itself up along the sides.

When walking begins, the problem is not to furnish

exercise, but to see that it is not overdone. It must also be remembered that a young child is not able to walk very far. This applies not only to babies just learning to walk, but to older children as well. Remember that they have short legs and that they must take at least two steps to your one. Going over the stairs is hard work for a young child, and especially in apartment houses, where several flights may have to be climbed, it is well to carry the child part of the way, at any rate, until it is strong enough to negotiate the whole distance without becoming tired.

Kiddie-Kars are dearly beloved by all children and furnish excellent exercise. As the child reaches four or five years of age, more and more possibilities of exercise present themselves, in running about and playing with other children, and, as we have said before, at this age it is not a question of providing exercise, but rather of guarding against overexertion.

FRESH AIR AND SUNSHINE

In a temperate climate a baby may go out of doors two weeks after its birth if it is born between April and October. If born between October and April it may go out at one month if the day is sunny and the temperature not below 32° F. As a matter of fact, most babies are not taken out until they are about six weeks old, as the mother is not very strong before this time, and the nurse has so much to do in looking after the baby and the mother that it is more convenient to keep it in doors. After it is six weeks old every baby should be out in the sunshine every pleasant day for as much of the day as is possible. The best place for a baby to be, when out of doors, is on an open piazza. The next best place is a sun porch, provided the windows can be raised, and



FIG. 11.—PEN.
(Courtesy of Jordan Marsh Co.)

lastly, if it is not possible to get the baby actually out of doors, it may be put in its crib or carriage, dressed as for out of doors, in a sunny room, with the windows open.

When the house has a piazza, the baby can easily get out in both the morning and afternoon. When it lives in an apartment house without a piazza and it is necessary for the mother to put the baby in its carriage and to go out of doors with it, household duties often make the morning outing impossible. Under these circumstances the indoor airing described above is much better than no airing at all.

Sunshine is of the utmost value to all living and especially to all growing organisms. It is especially important for babies during the first two years, as there is evidence that lack of sunshine is a very potent factor in the causation of rickets, which most commonly occurs between the ages of six and eighteen months. It is also known that abundant sunlight will prevent rickets and will cure it when it has developed. The special rays in sunlight, the so-called "ultraviolet" rays, which are concerned in preventing rickets, and the lack of which may cause it, are rendered valueless by passing through glass. So sunlight coming through the window is not so beneficial as that of out doors or coming through an open window. This is a practical point of considerable importance.

Cold Weather.—One of the commonest questions asked by mothers is concerning taking the baby out in the cold weather. The answer to this naturally varies materially according to what part of the country the baby lives in. In the temperate part of America a baby under two years of age should not be taken out of doors if the temperature is below 20° F. In the northern parts of the country and in Canada, where extreme cold is the rule during the

winter and where a temperature of zero feels no colder than a much higher temperature in Boston or New York, this rule may be somewhat modified. A baby should not be taken out on very windy, dusty days. The wind makes a great deal of difference, and one day at 20° F., which is sunny and windless, might be quite suitable for the baby to be out of doors, while another day, which is cloudy and windy, would be unsuitable. As regards weather and cold, use common sense.

Frozen Faces.—Babies' faces freeze very easily and, if the winter is cold, every doctor who is seeing many babies is likely to see a number with frost-bitten cheeks or chins. It is a good plan to smear the cheeks and chin with cold cream before going out in cold weather, as this lessens the tendency to chapping and also to freezing.

Fresh Air at Night.—Fresh air is desirable at night, but the crib should not be in a direct draft. If the weather is not too cold, the window may be opened widely. During cold weather the amount it is opened should be regulated by the outside temperature. In zero weather it is foolish to have the window wide open. A few inches is enough. Fresh air is not necessarily cold air, and reasonable ventilation may be secured without going to extremes. If possible, the temperature of the sleeping room of babies should not be below 50° F.

Baby Carriages.—There are two types of baby carriage: the heavy English type made usually of metal with a leather hood, and the more common lightweight wicker type which is much easier to handle. In selecting a baby carriage, pick one out which seems to be firmly balanced and whose springs are not too flexible. As the baby gets older and heavier and begins to move about a good deal it will be found that a steady carriage is a great convenience. When the baby gets to be a year or



FIG. 12.—HEAVY ENGLISH BABY CARRIAGE.
(Courtesy of Jordan Marsh Co.)



FIG. 13.—LIGHT WICKER BABY CARRIAGE.
(Courtesy of Jordan Marsh Co.)

more old the baby carriage is discarded, at any rate in the summer, for a go-cart, in which it sits up. It must not be forgotten that a go-cart is much colder than a carriage and that a child may easily get tired in one, because it cannot lie down when it wants to, as it can in a carriage.

It is not necessary to wheel the baby; it is just as well off if the carriage is standing still. The carriage should be in such a position that the sun does not shine directly into the baby's eyes, and in windy weather the carriage should be in such a position that the wind blows on the back or side of it, not on the front.

Automobiling.—If it is necessary to transport a baby anywhere, an automobile is the best thing in which to carry it; otherwise the baby should stay out of it. The place for the baby or small child is in its own house and yard, and the less it is carried about, the better. Long rides are especially harmful to small children. They become tired and nervous very quickly, and not infrequently have severe digestive disturbances after too much motoring.

Chapter XXI

THE SUMMER

IN the climate of New England it makes comparatively little difference whether a young baby goes away in the summer or not, as it is much easier to keep a baby cool and comfortable than an older child. All children over one year of age living in the city should, if possible, go away to the country or seashore for a few weeks.

THE BABY IN HOT WEATHER

On account of the bacterial contamination of milk and its liability to cause severe diarrhea the summer used to be an extremely hard and dangerous time for babies. Conditions have been greatly improved during the last fifteen years, however, owing to a better knowledge of how to care for milk, so that nowadays there is very little sickness in the summer among families who know how to take care of babies properly.

Food.—In hot weather all cow's milk which is given to babies should be pasteurized or boiled. During unusually hot, muggy periods it may be well to boil even a pasteurized milk. The milk should be put on the ice as soon as possible after it is delivered. If the part of the house where the milkman delivers the milk is sunny and hot, it is well to have a little covered box in a shady place and to have it left there.

The ice-chest should be kept full of ice and, on very hot days, the milk should be kept in the same compartment that the ice is in. It is better, if possible, to have



FIG. 14.—ICE-CHEST.
(Courtesy of Jordan Marsh Co.)

a small special ice-chest for the baby's milk. Tin ice-chests should never be used if they can be avoided. They are never as cold as a wooden chest lined with zinc or porcelain.

A baby's food tolerance is likely to be somewhat lowered in very hot weather. It is well, therefore, during an unusually hot spell to dilute whatever milk modification is being used with water, using 1 part of water to 2 parts of the modification.

Milk at the Seashore or Country.—Mothers frequently have their favorite city milk supply sent to the seashore or country. This is not necessary. In fact, it is, for a number of reasons, not even desirable. Such milk may be very old before it is consumed, as it is produced in the country, shipped to the city, then shipped to the country or seashore again, all of which involves at least twenty-four hours, more likely forty-eight. Furthermore, by the time it arrives the ice in which it is packed is usually melted, and the milk not cold. The best thing to do is to secure the best local milk possible, which will be in the country a raw milk, and then to boil or pasteurize it (see section on Milk). The advantage of this is that the milk, being delivered when it is only a few hours old, is very fresh, and by boiling or pasteurizing the dangers that might come from any possible carelessness in production are avoided.

Water.—Plenty of water, both inside and out, is a good rule in hot weather. The baby should be given frequent small drinks of cool boiled water at about 70° F. and should be sponged several times during the day.

Clothing.—On very hot days the baby should be dressed only in its band and diapers, provided he is not in a draft. Most mothers do not realize that a baby needs very few clothes on hot days. The overclothing of babies during

hot weather is undoubtedly one of the causes of summer diarrhea.

Electric Fans.—A small electric fan is often a godsend, especially at night when there is little air stirring. Have it about six feet from the baby, and adjusted so that the air current blows about 2 feet over it and not on it.

Flies and Mosquitoes.—Keep flies away; they may carry disease. A fine mosquito netting should be draped over the crib or pen if these pests are abundant. Be sure that the pail in which the soiled diapers are kept is tightly covered. Before going away buy an ounce of oil of pennyroyal or citronella; a dab of this here and there over the child before it goes to bed at night will help to keep mosquitoes away.

OLDER CHILDREN AT THE SEASHORE OR COUNTRY

Food.—If at a hotel, the child should be kept on the same sort of diet that it had at home. A five-dollar bill to the cook or whoever serves the food is a good investment. If any ice-cream is given, it is necessary to be especially careful about its quality because ice-cream made from impure milk or cream is not infrequently the cause of dysentery. It is not wise to allow any child under five years of age to eat any ice-cream that is not made in its own home. No raw fruit or berries should be given to children who are less than five years old.

Daily Rest.—The daily rest should be kept up. During the summer, when the child is active, it is needed more than ever.

Bathing.—Much harm is done by indiscriminate bathing. Many mothers who are extremely careful about having the child's room warm, and who take the greatest pains that the daily cleansing bath shall be of just the right temperature, allow young children or even babies

to go into water that is too cold even for an adult. A beach is a very healthy place for a child, provided care is taken that it is protected against a too hot sun, and children of two years may have bathing suits and be allowed to paddle about in warm pools left by the tide, or in very shallow water. As a general rule, however, children should not be allowed to become actually immersed until they are five years old unless the water is very warm (in the neighborhood of 72° F.), as it is some places on Cape Cod and along the Jersey coast. No child under twelve years should go into the water more than once a day, no matter how warm it is. In places where the water is very cold, as it is along the northern coast of New England, the bath should be of a very short duration. The child may be allowed to play about the beach in its bathing suit for a good part of the morning, provided the day is warm, but should not stay in the water more than five minutes. It should then immediately have a brisk rub-down and be dressed. If children do not react well to cold water, and very many do not, they should not be allowed to go in bathing, no matter how old they are.

Chapter XXII

TRAVELING

TRAVELING WITH THE BABY

It is better not to travel with the baby if it can possibly be avoided. A baby should not be carted about just because its parents want a change or some relative wants to see it. The proper place for a baby is at home. Having the baby ought to be change enough for the parents and, if relatives want to see the baby, let them come to it. If traveling becomes necessary, there are two points of especial importance: (1) What is the baby going to be carried in while traveling? (2) What is its food to be and how is it going to be prepared? The best thing to carry a baby in while traveling is a small market or clothes basket with a pillow in it. Another fairly satisfactory bed can be made from an extension suitcase padded with blankets. When the baby is not in the suitcase, its diapers, blankets, and clothes may be carried in it. If the trip is but for one day a supply of the baby's milk may be carried. It should be packed in ice in a small box or put ice cold into a large thermos bottle. Warm milk should never be carried in a thermos bottle, because in a thermos bottle the milk is kept for a long time at the temperature best suited for the growth of bacteria in it. Another thermos bottle, full of hot water, can be carried to heat the milk with. If the trip is to be longer than one day dry milk is the best food to use. This may be obtained now at most drug stores. It is a

very satisfactory temporary food when fresh milk cannot be obtained, and consists simply of cow's milk which has been evaporated down to dryness and powdered. The brands most used are Dryco and Klim. Dryco has had a portion of the cream removed. Klim comes in two forms, one of which is made from skimmed milk, the other from whole milk. The second is the one to use for normal babies.

Before going on a trip with the baby the doctor should be consulted as to what strength of dry milk should be used, as he knows the baby and knows what it can digest. In general the following strengths of Dryco may be used for normal babies:

1 month . . 2 to 3 level tablespoonfuls dry milk to 4 ounces of water.
3 months . . 3 to 4 level tablespoonfuls dry milk to 5 ounces of water.
5 months . . 4 to 5 level tablespoonfuls dry milk to 6 ounces of water.
8 months . . 7 to 8 level tablespoonfuls dry milk to 8 ounces of water.
1 year . . . 8 level tablespoonfuls dry milk to 8 ounces of water.

If "Klim" is employed about half the amounts of powder given above should be used.

The ordinary water on the train should not be given to babies or used in making up the feeding. Boiled water can be carried from home, and bottled spring water can usually be obtained on the train.

TRAVELING WITH OLDER CHILDREN

The child's own milk or dry milk should be used for all children under six years of age while traveling, unless the diner, restaurant, or hotel is supplied with special milk from certified dairies in specially sealed bottles. Such milk as this may be taken by any child. No child should be allowed to take milk which has been obtained in a small station, waiting room, or lunch room. Older

children can get along perfectly well without milk for a few days if necessary. It is just as important to be careful about the rest of the child's diet as if it were at home; there is no more reason for giving raw fruit, candy, and peanuts when on a train than when at home. Digestive upsets are very common in children after train trips and are due not so much to the trip itself, as to the miscellaneous assortment of injurious food which is often eaten. It is much better, if making a short journey, to pack a small lunch basket with food for the child than to trust to food bought on the train or in a station. It makes a trip much less tiresome, both for mother and child, if some game, toy or book, preferably new, is taken along to help pass the time.

Chapter XXIII

TRAINING

OBEDIENCE

ONE of the most important duties of parents is to train their children to be obedient and to have respect for authority. Such training is not only of the greatest importance to the child, but to the family, state, and nation. One of the greatest dangers to our country at this time is the lack of the spirit of obedience and of deference and respect for constituted authority. This lack is due more to the failure of parents to train their children than to any other one factor. The training of the child must begin the day that it is born, because even very young babies soon learn whether they can have their own way or not. If it is begun at once habits of obedience are acquired in infancy, and it is not difficult to perpetuate them in childhood.

People in general do not appreciate of how much advantage, as regards health and life, the habit of obedience is to a child. The child that is obedient is much less likely to be ill than the disobedient child, because by following the directions of those who know far better than it what is good for it, it avoids trouble. Incidentally, it cannot be stated too emphatically that the adult with his judgment and experience is much more competent than any child to determine what the child shall eat and wear, when it shall go out of doors, rest and go to bed, and how much it shall play, than is the child itself.

When a child is sick its chances of recovery are much better if it has been taught to obey. The obedient child does as it is told, takes its food and medicine, submits to whatever treatment is necessary, and saves its strength. The disobedient child, on the other hand, resists its treatment, refuses its food and medicine, and exhausts what little vitality it has. Many a child has died that would not have if it had been taught to obey. Many a death certificate has been filled in with the name of some disease when the cause of death should have been given "failure of parents to teach obedience." Furthermore, many children are killed by accident who would not be if they were taught to obey a command instantly without question.

The proper training of children is of so much importance that parents ought to be not only willing, but glad, to undertake it themselves. They should never turn it over to nurses or nursery maids or to the schools. If they are not competent to train their children properly or are not willing to give the proper amount of time and attention to it, they should not have children. The personal influence of parents should play an important part in the training of children. Nothing can take the place of the influence of sensible, reasonable, firm but kind parents in inculcating habits of obedience and in shaping the future of a child. The child should be made to understand at once that its parents, not it, are the most important members of the household, that they are the officers and that it is only a private, and that it is, therefore, to take orders, not to give them. It is more difficult, of course, to make some children obedient than it is others. Nevertheless, they can all be taught to obey. If it is difficult to teach a child obedience, the parents should be patient, remembering that the

stubbornness and wilfulness is probably inherited from them or else is due to some defect in their methods.

Parents and others who deal with children, while teaching and demanding obedience, must be careful to avoid friction and causes for exercising their authority. They ought to be able to see that trouble is brewing before the child does and to be able by tact to avoid it, without the child having any suspicion of it. If it cannot be avoided, it must be met firmly when it comes, and obedience enforced, no matter what the cost. If the parent loses, it is harder for him to win the next time. If the child never wins, it soon ceases to expect to win and doesn't try. On the other hand, if a parent demands and exacts obedience, he must be extremely careful never to give an order to a child unless he intends to have it obeyed. He must be on the watch not to give thoughtless, senseless, and unnecessary orders, because once given, they must be enforced. If they are not, the child at once loses respect for all orders and sees no reason why it should obey any. It cannot be expected to know what orders are important and what are not, and naturally cannot understand why it should be expected to obey at one time and not at another.

Punishment.—If a child is told that it will be punished if it does or does not do some certain thing, it must be punished if it disobeys. Otherwise it loses all respect for its parents and naturally sees no reason why it should obey in the future. Punishment does not by any means always imply corporal punishment. In fact, corporal punishment is seldom necessary or advisable. At times, however, there is nothing which will take its place. In certain crises there is nothing which will bring a child to terms but a good, sound spanking. If spanking is necessary, it should be hard and thorough, so

that it will not be forgotten for a long time. If thoroughly performed it will not be necessary to repeat it often. A parent should never spank a child when angry. He should wait until he is calm, and explain to the child just why it is being spanked. He should not tell the child that it hurts him more than it does the child, because the child knows that that is not true, and no child has any respect for a liar. It is useless to spank a child before it is two years old, because up to that time it is too young to thoroughly understand what it means and what it is for. A child should never be struck in anger or have its ears boxed. Parents should never allow anyone else to inflict any form of corporal punishment upon their children. It is doubtful, in fact, if it is advisable for them to allow anyone but themselves to punish their children in any way. It is hard to realize how brutal some nurses and nursery maids are to the children placed in their care. Children should never be punished by being shut up in a closet, as it is likely to terrify them. They should, in fact, never be punished in any way that will frighten them. Putting them to bed is a very good form of punishment. Depriving them of some toy or article of food of which they are especially fond, or not allowing them to do something which they are anxious to do, are also good and harmless forms of punishment. As they grow older a good, straight talk is often sufficient.

"Tantrums."—Some young children have violent fits of temper, commonly known as "tantrums," if they are crossed or are not allowed to have their own way. It is useless to spank a child in a "tantrum." The best method of treatment is to tell the child that it is not fit to associate with, and to leave it alone until it gets

over it. After it is all over, a quiet, sensible talk will often help to prevent future outbreaks.

Bribes.—A child should never be given or promised anything for doing something which it is right for it to do. It ought to do it simply because it is told to do it. If it is given something, it implies that the thing which it is asked to do is wrong, and no child should ever be asked to do anything which is wrong.

Lies.—A child should never be deceived. A parent should never lie to a child or make it any promise which it cannot keep. A child never forgets that an adult has lied to it. It never forgives a lie and never respects the person who tells it. Children are naturally truthful. They do not lie unless they are taught. People that lie to their children cannot expect them to be truthful. The natural tendency of children to exaggerate and romance must not, however, be confused with lying. Lying is a deliberate falsification for a definite purpose.

PSYCHOLOGY OF THE CHILD

It is very hard for most adults to understand the point of view and mental processes of a young child. They forget how limited is the child's experience, how narrow its field of vision, and how ignorant it is of even the most ordinary things. They do not realize that what seems important to them means nothing to the child, and that what interests the child most seems nonsensical to them. They consequently expect altogether too much of it and expect it to act like an adult when it is only a child. The lot of a lone child in a family of adults is, therefore, often a hard one. Parents should try to enter into their child's life as fully as possible to get its point of view and to enjoy its pleasures with it. They should also sympathize with it and help to make its sorrows lighter.

"They may be comedy to the parents, but they are tragedy to it." Both will profit by such intimate companionship. The parents should be the child's companions. They can be that without losing its respect. Children who respect and understand their parents do not fear them, and seldom need punishment.

A child should always be treated respectfully and its point of view and opinions given due weight. It should never be ridiculed because it does not understand or see things in the same way as an adult. Its questions should always be answered thoughtfully and sensibly. They must also be answered in such a way that the child is taught to think for itself.

Good Manners.—In general, the standard of the child is that of its parents. If they are loud, noisy, and quarrelsome, the child is usually the same. If they are quiet, considerate, and affectionate, the child is also. Children must be taught many things about politeness, of course, which they cannot be expected to know of themselves, but, no matter how much they are taught, they will never have really good manners unless their parents have. Too much must not be demanded of them, however, as they are only children and ought not to be expected to have the manners of adults. They should be made, however, to show proper respect for their elders and to keep themselves in the background. There is nothing more disagreeable than the spoiled, noisy, talkative child that has been brought up to think that it is the most important member of the family and that it must occupy the center of the stage at all times. Children should be taught to eat quietly and properly just as soon as they are able to understand and to handle a spoon, fork, and knife. Nothing makes a worse impression on strangers than bad table manners, and nothing is harder

to overcome in later life than bad table manners acquired in childhood.

Responsibility.—It is very important to develop a sense of responsibility early. Children should be given little tasks, like putting away their toys, to do by the time they are two or three years old. They should be taught to put away their own out-of-door clothes and to know where they are, to help in little ways about the house, and should be held responsible for the things which are given them to do.

Books and Stories.—Great care must be taken in selecting the books for young children not to get those which are too old for them. Their experience is limited and they can appreciate only simple things. They believe the stories which are read to them and are, in consequence, excited and disturbed by them. They dream about them and are worried by them. Furthermore, if they do not thoroughly understand what is read to them, they get erroneous impressions, establish false standards, and are mentally overstimulated and fatigued.

Great care must also be taken not to read or tell stories to children which will frighten them. It is wicked to tell young children about ogres and giants. Even "Little Red Riding Hood" may frighten a young and nervous child, because to it the story is real. The adult must always bear in mind how much a young child may be terrified by a story, which to the adult seems ridiculous, and how it will misunderstand something which to the adult is very plain.

Chapter XXIV

EDUCATION

THE best way to educate a young child is to set it a good example. Young children are naturally imitative and intuitively do what their elders do. If they hear good English spoken, they speak good English. If they hear poor language and slang, they use the same. Unfortunately, it sometimes seems as if it were easier for them to pick up the bad than the good. If the conversation in the home is about the questions of the day, books, pictures and music, they will become interested and conversant with worthwhile things; if it is about sports, parties, dances, and cards, they will know and think of nothing else. If all the music that they hear in the home is "jazz," that is all the music that they will know; if the standard is high, they will learn to like and appreciate good music and will not enjoy other kinds.

If properly brought up at home, children do not have to be sent to school to learn to brush their hair, clean their teeth, and tie their shoes. They know how to use a spoon and fork and understand the principles of cleanliness and decency. If given the opportunity, they will learn to use their hands and simple tools at home. Much can be taught young children at home in their play. They can be taught letters and numbers from their blocks and easily introduced to the rudiments of reading and arithmetic. Mothers and nurses must never forget, however, that it is impossible for young children to fix their attention or to concentrate for more than a few minutes at a time, and that their minds are very easily

tired. They must also remember that, while the memory of young children is very good, it is also most erratic, and must make allowances on this account.

Time to Begin School.—Most children in this country go to school when they are five or five and a half years old. It would be better for children, physically, if they did not go to school before they were seven years old. As a matter of fact, their education would probably not suffer if they did not, because children learn so much more rapidly after this time than before that they quickly make up the lost ground. It is advisable for many children to go earlier, however, especially if they are the only children, for the sake of the companionship and training in teamwork which they cannot get at home. It is advisable for many others, unfortunately, because they need the training in obedience, good manners, and self-control given in the schools, which they fail to get at home. In many other instances, also, it is necessary for children to go to school early in order to relieve their mothers of their care.

Kind of School.—When children go to public schools it is, of course, impossible for their parents to pick out the school. When they go to private schools, however, parents should take far more care in choosing the school than they usually do. They should investigate the school building and the character of the teaching and the teachers for themselves, instead of sending their children to some school simply because it is convenient or fashionable. Parents ought also to take more interest in the schools which their children attend. They should visit them from time to time, and should personally become acquainted with the teachers, in order that they may judge of the character of the work for themselves and be able to co-operate with and help the teachers.

We have no sympathy with those schools which allow the child to do as it pleases and to choose for itself what it will study. We do not believe that a young child knows what is good for it or that it is competent to judge what it should and what it should not study. We are old-fashioned enough to believe that children should be made to work, to obey, and to respect authority.

One session daily is enough for young children. Open-air schools are of advantage if the children are properly protected. The chances of contagion are diminished and the children are not deprived of the fresh air and sunshine which is due them. If open-air schools are not properly administered, however, they may be very dangerous.

RELIGIOUS EDUCATION

The religious education of children is, unfortunately, being sadly neglected. Children should begin to go to Sunday school at least as early as to other schools, and to church as soon as they can keep still long enough at one time. Most Sunday schools are open to criticism medically, however, in that they do not have any medical inspection of the children and, in consequence, contagion is very common in them. Strange as it may seem to some, it apparently makes no difference in the severity of whooping-cough, measles, and other contagious diseases whether they are contracted at Sunday school or elsewhere. Children should be told Bible stories at home and should be at least as well acquainted with Moses, Noah, and Jacob as with "Jack, the Giant Killer" and "Puss in Boots." The best way to teach religion, however, is by example in the home. It does not do much good to have a child taught about honesty, truthfulness, and love one hour a week and let it see and hear dishonesty, lying, and hate all the rest of the time. It doesn't help

it much to be told about the goodness of God at church and never hear Him mentioned at home except in an exclamation or oath. Children often ask very difficult questions about religious matters. However difficult they are, they must be answered as well as possible, and answered truthfully. It may not be possible to answer a question fully because of the limited knowledge and comprehension of the child, and often also of the parent. Nevertheless, some fairly satisfactory answer can almost always be given, which, as far as it goes, is the truth.

SECTION V

DISEASES, EMERGENCIES, AND MEDICINES

Chapter XXV

THE CONTAGIOUS DISEASES

THE contagious diseases that a child is liable to have are diphtheria, scarlet fever, measles, chicken-pox, whooping-cough, mumps, and German measles. All of the contagious diseases have what is known as an "incubation period," which is fairly constant for each disease. By "incubation period" is meant the time after the child is exposed to the disease until it develops symptoms. Measles is probably the most contagious of all these diseases.

MEASLES

Measles is a very contagious disease and almost every child coming into contact with another child who has it, especially in the early stages, will develop it. It is very common, much more so than either scarlet fever or diphtheria. The cause of measles is not known. The incubation period is from ten days to two weeks. The symptoms are usually as follows: The child begins to have a fever and usually a sharp, hacking cough with considerable running from the nose and redness of the eyes. In most cases this lasts two or three days before the characteristic rash appears. The rash is dull red and blotchy, appears first upon the face, and then extends down over the body and limbs. At the height of the

disease the child is completely covered with it. The inflammation of the eyes, running nose, and cough are just as much a part of the disease as is the rash. In some instances the rash may not come out for as long as a week after the first symptoms of the disease have appeared. The fever of measles lasts for about a week. While it is true that most children recover from this disease and without any serious complications, it should always be regarded as a serious disease, and the doctor should be called at once. The chief complications are otitis media and pneumonia. There is no specific treatment for measles, such as a serum or vaccine. The treatment consists in keeping the patient warm and comfortable and preventing complications.

SCARLET FEVER

Scarlet fever is much more dangerous than measles. It is, however, not nearly as common. The incubation period is short, usually from four days to a week, and the exact cause of the disease is unknown. It usually begins very suddenly with a high fever and often a sore throat. In the course of one or two days a fine, bright red rash makes its appearance, beginning on the neck and chest, and extending to the face, arms, and body. The rash is much finer than that of measles and does not have the blotchy appearance of the measles rash. A child with scarlet fever will usually be in bed a month at least, but will probably not have fever or be acutely sick all of this time. The chief complications are swelling of the glands in the neck, and inflammation of the kidneys, ears, and heart. There is no serum of proved value in the treatment of scarlet fever. The treatment is that of any febrile disease. Kidney complications can usually be prevented by a proper diet and a large fluid intake.

DIPHThERIA

Diphtheria is more common than scarlet fever, but not so common as measles. We know more about it than about almost any other disease. It is caused by the diphtheria bacillus and is transmitted by direct contact. The incubation period is very variable, but is probably usually from one day to a week. The chief manifestations of diphtheria are fever and a sore throat. A grayish membrane forms on the sides of the throat, usually on the tonsil, and extends rapidly as the disease progresses. It may also occur in the nose. If it is untreated, diphtheria is a very fatal disease, and before the introduction of antitoxin was the most dreaded of all the diseases of childhood.

Prevention of Diphtheria.—We now have the means at our disposal to prevent diphtheria, and if the public will co-operate with the state and city boards of health in having their children immunized against it, diphtheria should be in a few years a very rare disease. Some children are susceptible to diphtheria and may take it; others are not. It is possible to determine by a very simple and harmless test, known as the Schick test, the susceptibility of any child. If a child is found to be susceptible, it may be immunized by means of three injections at weekly intervals of a protective serum. This process is entirely without danger, and causes no discomfort other than slight soreness of the arm for a day or two at the site of the injection. It is the duty of parents to have their children immunized in this way, and is just as important as having them vaccinated.

Treatment of Diphtheria.—The diphtheria germs growing in the throat produce a powerful poison called diphtheria toxin. This poison circulates through the system

and causes the fever and the complications, the chief of which are paralysis and weakness of the heart. We possess, however, a very powerful neutralizing agent for diphtheria toxin, which is called diphtheria antitoxin. It contains a substance which unites with the diphtheria toxin, circulating in the system, neutralizes it, and renders it harmless. It is of the utmost importance that diphtheria antitoxin should be given at the earliest possible moment before the diphtheria toxin has done any harm, and it makes all the difference in the world, with regard to the final result of the case, whether the antitoxin is given early or not. If given early in the course of the disease, that is, on the first or second day, the chances of a fatal result are very, very small. If given later the child may get well or may not. Of course many children recovered from diphtheria before the introduction of antitoxin, but the mortality was very high. It is criminal not to give antitoxin to a child who has diphtheria, and it is possible in the case of objectors to this method of treatment to compel them by law to have it given. All the other children in the family should be given protective doses of antitoxin.

CHICKEN-POX

Chicken-pox is a relatively mild disease. Its incubation period is from ten days to three weeks. It is manifested by the appearance of small red spots over the face and body, which soon change to little blisters containing fluid. These spots do not come out all at once, but appear in scattered crops. At the height of the disease, in a severe case, the child may be covered with them from head to foot. The temperature is not ordinarily very high, and in most cases the child is not very sick. It should, however, always be kept in bed for the first

few days, whether it seems sick or not. The most important point in the treatment of chicken-pox is to prevent scratching, because, if the child scratches, some of the blisters may become infected and cause considerable trouble. Permanent scars are much more likely to be left, moreover, if the spots are scratched. Although chicken-pox is not a serious disease, it is a rather annoying one, for the child cannot go back to school until the scabs of all the blisters have come off. This usually takes about three weeks. About the only danger of chicken-pox is that it is sometimes confused with small-pox.

WHOOPING-COUGH

Whooping-cough is one of the most annoying of the contagious diseases and, while it is rarely dangerous in older children, it is always dangerous in small babies. It is caused by a definite germ, the so-called Bordet-Gengou bacillus, which enters the lower part of the throat, and by its irritation there causes the cough. The incubation period is uncertain, but is probably from one to two weeks. It is probably necessary for a child with whooping-cough to cough directly into the face of another child in order to infect it. The disease begins very insidiously with a slight cough, which in its early stages resembles that of an ordinary cold, and, until more characteristic symptoms have developed, it is not possible to be sure whether the child has whooping-cough or not. In the course of a week the cough begins to be more severe and increases progressively for several weeks. The chief characteristic of the cough of whooping-cough is that it is paroxysmal. The paroxysm consists of a series of short coughs, each one becoming more severe than the one preceding, until the child becomes very red in the face and has difficulty

in getting its breath. Then the breath is drawn in with a sharp, crowing sound, the so-called "whoop." This is not present in all cases, however, and it is quite possible for a child to go through whooping-cough without ever whooping at all. There is very likely to be vomiting after the paroxysm of cough. Children with ordinary coughs not infrequently gag and vomit, however, so that the presence of vomiting with the cough is by no means a sure sign of whooping-cough. The disease is usually at its height about the end of the third week, after which the severity of the cough begins to lessen. A child with whooping-cough will usually cough considerably for about six weeks, and should not go back to school until the end of this time. It is probable that the disease is only very slightly contagious after the first few weeks. A child with whooping-cough is, therefore, most dangerous to others at the beginning of the disease.

Prevention and Treatment of Whooping-cough.—There is a vaccine which has been used for some years in the prevention and treatment of whooping-cough. It is undoubtedly far more efficient in the prevention of the disease than in the treatment. Its use is entirely without danger. If a child has been exposed to whooping-cough, it should be given four injections of the vaccine at four- or five-day intervals. The protection afforded by this vaccine is not sure, but it is undoubtedly true that there is much less chance of a child so treated contracting the disease than if it had not had the vaccine, and, if it does get the disease, it will probably be less severe than it would be otherwise. After the child has once contracted the disease, there is no vaccine, serum, medicine, or application that will stop the disease. The vaccine, however, if given during the first two weeks, will probably

make the disease less severe than it would have been without it. There is probably no use in giving whooping-cough vaccine to children after the first two weeks.

Drugs.—Innumerable drugs have been used in the treatment of whooping-cough. It is a general principle in medicine that, when a great many different drugs are recommended and used in the treatment of a disease, there is no one of them which is particularly efficient. It can be said, however, that, in most cases, whooping-cough is somewhat benefited by drug treatment and the spasms made less severe. There is, however, no drug that will cure whooping-cough. Once developed, it must take its course, and all that can be done is to treat the child symptomatically, and, if possible, to diminish the number and severity of the paroxysms. All children with whooping-cough should be kept out of doors as much as possible, as children who are out of doors all day undoubtedly do much better with whooping-cough than those who are not. The parents of children with whooping-cough must be very careful to remember the rights of others, and should keep their children away from other children. They should not take them in public conveyances or to public places. Children with whooping-cough should wear a conspicuous arm band or some other designation, so that other mothers can keep their children away.

GERMAN MEASLES

German measles is a fairly common disease, although by no means as common as the ordinary type of measles. It is a much milder disease, and a child ill with German measles is very seldom sick more than two or three days. The incubation period is between two and three weeks. The disease is manifested by a rash all over the body,

which, however, is not so marked as the rash of true measles, and by slight fever, which rarely lasts more than two days. There is also an enlargement of the lymph-glands all over the body. An especial characteristic is slight enlargement of the small glands directly behind the ears. There is no especial treatment other than keeping the child in bed. The disease is not a dangerous one.

MUMPS

The incubation period of mumps is three weeks, the longest of any of the contagious diseases. The disease consists of a swelling of the parotid glands which lie at the angle of the jaw, below and in front of the ear. The swelling is usually on both sides and may be considerable. The submaxillary glands below the jaw in front may also be involved. The swollen glands are often quite painful. The temperature is usually moderately elevated. The disease is not ordinarily a dangerous one and there is no specific treatment for it. Many people believe that it is possible to tell whether a swelling of the face is mumps or not, according to whether sweets and sour food cause pain or not. This belief is entirely without foundation. Although mumps is ordinarily not a severe disease, in a few cases there may be inflammation of the testicles or ovaries as well as of the parotid glands. It is, therefore, always important to keep a child with mumps in bed. The duration of the disease is usually about one week, but there is danger of contagion up to three weeks after the time the swelling makes its appearance.

SMALLPOX AND VACCINATION

Up to the end of the eighteenth century smallpox was one of the most widely spread of diseases, and enor-

mous numbers of people died each year in many epidemics all over the world. It was primarily a disease of childhood and the mortality was greatest among children. At the present time smallpox is a very rare disease in this country. This is owing entirely to vaccination, as it has been possible by this means to keep smallpox in check. If the majority of people were not vaccinated smallpox would very soon be as common as it used to be. Every child should, therefore, be vaccinated. The best time to vaccinate a child is when it is between three and six months old, as the constitutional disturbances accompanying vaccination are usually less at this age than later. The child should thereafter be vaccinated every seven years. Vaccination, if properly done, is practically without danger. There is no danger of transmitting tuberculosis and syphilis in this way, because the vaccine is taken from calves which are proved not to have tuberculosis, and cows do not have syphilis. There is no danger of infection with other germs if pure, standard vaccine is used, as it always can and should be. There is no danger of infection if the vaccination is done aseptically and the wound treated like any other open wound, that is, covered with a sterile dressing and kept covered.

The course of a normal vaccination is about as follows: A small pimple appears at the seat of vaccination on the fourth or fifth day. In the course of the next day or two a blister appears on the top of the pimple. This enlarges until it is from $\frac{1}{4}$ to $\frac{1}{2}$ inch in diameter. There is some swelling and redness about it, the amount varying in individual cases. A scab begins to form in a few days, which drops off in the course of several weeks. There may be a little fever and general malaise for a day or two at about the end of a week. There is often some swelling

and tenderness of the glands under the arm or in the groin. None of these things ought to be seen by the parents, however, as the wound should be kept covered. The doctor should see the child at the end of the first week in order to determine whether the vaccination has taken or not, and whether it is healthy.

We do not believe in the celluloid shields which were formerly used after vaccination. They are dirty, and favor rather than prevent infection. The vaccination should be dressed with sterile gauze and should be kept covered with gauze until the scab drops off. Great care should be taken that the vaccination is not struck or bruised in any way, and that the scab is not knocked off. Care should also be taken that when the child takes its bath the arm does not get wet as the vaccination heals much more quickly if it is kept dry.

Chapter XXVI

OTHER DISEASES AND BAD HABITS

It is not well for a mother to attempt to know a great deal about many diseases, and it is perfectly true that a little knowledge is a dangerous thing. On the other hand, the intelligent mother should know in a general way the main facts concerning the more common diseases that her child may have. If a child appears really sick, however, she should call the doctor at once and not trust to her own judgment or medication.

FEVER

A clinical thermometer, rectal for children under four years of age and mouth for children over four years, should be a part of every mother's kit. The temperature of the baby and young child is normally a little higher than that of the adult. A temperature which is not over 99° F. in the mouth or over 99.6° F. by the rectum may be considered normal for a baby or young child.

Most of the diseases of childhood are accompanied by fever. If a child has a temperature of 101° F. or over, however, it is sick enough for the doctor to be called. A high temperature in a baby or young child does not have as much significance as the same temperature in an adult, because children may develop a high fever very quickly from relatively slight causes. It may, moreover, go down again as quickly as it came up. Mothers are often greatly worried because during the course of a sickness the temperature may rise to 103° F.,

104° F., or even 105° F. They usually attach altogether too much importance to the temperature, forgetting that it is only one of the manifestations of disease and that it is the one which is most easily measured. Too much importance must, therefore, not be attached to the temperature if the other symptoms are favorable. It cannot be stated too emphatically that fever is a part of the disease process, that it cannot be removed, and that a high temperature is rarely, in itself, dangerous. A baby with such a disease as pneumonia **must** have a high temperature; it is a part of the disease and not of serious import. A doctor much prefers to see a relatively high temperature in pneumonia than a low one.

In certain cases, however, fever may cause restlessness and sometimes convulsions, in which case it is desirable to attempt to reduce it one or more degrees. This is usually best done by the use of alcohol or sponge-baths or the cold pack. We wish to emphasize once more to the mother who keeps asking her doctor "what can be done to relieve the temperature?" and who is very much worried because the temperature is high, that the condition of the child, not its temperature, is the best criterion of how sick it really is.

COLDS

There is no child, at any rate in the North Atlantic states, who does not have one or more colds during the winter. The ordinary cold in most cases is not serious, but occasionally it may be followed by more serious conditions, such as mastoid disease, bronchitis, or pneumonia. It is, therefore, important for the mother to realize that when a child has a cold it is sick and should be treated accordingly.

The exact cause of colds is in dispute, and, as a matter

of fact, but little is known concerning it. There is no question that chilling of the body has a great deal to do with the process commonly spoken of as "catching cold." On the other hand, infection undoubtedly also plays an important rôle, which is shown by the fact that a cold in one member of a family is often followed by colds in those who have been associated with him.

Prevention of Colds.—The reason that babies and small children are so much more susceptible to colds than adults is that their mucous membranes are delicate and react much more easily to infection and to changes in temperature than do those of older people. What can the mother do to prevent colds? In the first place, if any of the family has even the slightest cold, he or she should keep away from the baby; if the nursemaid has a cold, she should have nothing to do with the baby until she is over the cold. In the second place, it is very important to prevent the baby or child from becoming overheated and then chilled. This happens very easily when houses, and especially apartment houses, are kept as hot in the winter as many are nowadays. A temperature of 68° or 70° F. is suitable. Our own opinion is that too hot houses are more likely to cause colds than too cold houses. Children that live in hot houses should wear thinner clothes when indoors and thicker clothes when outdoors than those who live in cold houses. They are less likely to get overheated if they do. When the baby or child is dressed to go out, it should be dressed in a cool room and should go out as soon as it is dressed. Staying in the house for ten or fifteen minutes after the outside clothes have been put on, while the nursemaid or mother fusses about something else, is a common cause of overheating. When children are outdoors they should be taught not to sit on the ground, and, if they become

heated, to keep moving instead of sitting down. It is probably true that many colds may be avoided by proper precautions, but it is also probably true that in the climate of the North Atlantic states practically every child will have one or more colds during the course of the winter, no matter how carefully precautions are taken.

Treatment of Colds.—Much may be done in the early stages of a cold to make the child more comfortable, and very possibly to shorten the course of the disease. As soon as the child begins to snifle and to show signs of having a cold, it should be put to bed in a room having a temperature of about 68° F. and kept in this room during the first twenty-four hours of the cold. A laxative should also be given, and nose drops instilled into the nose. If there is any fever the doctor should be called. During the second day of the cold, if the child is not very sick, it may be let up about the house, provided the various rooms are of about the same temperature. Otherwise, it should be kept in bed longer. One of the most important things to remember in taking care of a child with a cold is to keep it in an even temperature. A child should not be forced to eat during a cold, as the chances are that there will be very little desire for food, and the digestion may be upset if food is forced. If the cold is not a severe one, the regular diet may be continued. If the child has fever and appears sick, it is well to confine the diet to milk, cereal, toast, and soup. If the cold runs the usual course, the child should be out of doors again in a few days, provided the weather is warm, calm, and sunny. It is never well to let a child who has had a cold go out for the first time on a very windy day. Many colds hang on for several weeks, getting into a subacute or chronic state. Under these conditions the child should not be kept in the house.

ADENOIDS

Adenoids are masses of tissue which lie in the upper part of the throat, behind the nose. Every infant and child has normally a certain amount of this adenoid tissue, which tends to grow less as it grows older. If it becomes much enlarged or infected it may injure the child and its removal may be necessary.

Symptoms of Adenoids.—The most striking symptom of enlarged adenoids is difficulty in breathing through the nose. This is especially noticeable in small babies when they nurse, and in children when they are asleep at night. It is possible for nursing and for sleep to be considerably interfered with by enlarged adenoids. It is also possible that in certain cases the mechanical blocking up of the nose by greatly enlarged adenoids may somewhat interfere with the general nutrition of the child by interference with its breathing. If a child has enlarged adenoids, a cold in the head is likely to be more severe than it would be otherwise, and there is also more danger of the cold settling in the ear.

Treatment of Adenoids.—If the adenoids are doing the child any harm they should be removed, no matter what the age of the child or the time of year. It is not a serious operation. Although it is true that adenoids may return, if removed in infancy, they must be removed, nevertheless, if they are doing the child harm. The two most important indications for the removal of adenoids are: (1) obstruction to breathing; (2) frequent attacks of earache or running ears. As a general thing, removal of the adenoids does not prevent a child from having colds. It will almost certainly, however, prevent the colds from being as severe as they were before.

TONSILS

The tonsils lie in the sides of the throat, and are made up of the same sort of tissue as adenoids. They are, however, much larger than the adenoids. It is not certain what the tonsils are for, but they were undoubtedly put there for some purpose, and should not be removed, therefore, unless there is some very definite reason for it and unless it can be clearly seen that some good is likely to be accomplished by their removal. In general, it may be said that altogether too many tonsils are taken out. The removal of the tonsils is a more serious operation than that of adenoids. While it is seldom dangerous, certain serious complications may occur and accidents happen in a few instances. The evidence should, therefore, always be carefully weighed before a child is submitted to this operation. There are a number of indications for the removal of the tonsils, some of the more important of which are the following:

1. Certain tonsils may be so large that they mechanically block up the throat and interfere with swallowing. Such tonsils should always be removed.

2. If a child has swollen glands in the neck, the chances are that these glands are swollen on account of the absorption of poison from the tonsils. The presence of such glands is usually a sufficient indication for the removal of the tonsils.

3. If a child has frequent attacks of tonsillitis the tonsils should be removed.

4. Rheumatism, inflammatory heart disease (endocarditis), and St. Vitus' dance very often have their origin in an inflammatory condition of the tonsils. It is, therefore, usually desirable to remove the tonsils

when children have had these diseases in order to prevent their recurrence.

5. Frequent colds and cough. The removal of the tonsils does not prevent a child from catching cold, and many mothers, likewise doctors, are much disappointed to find that children have just as many colds as they had before the tonsils and adenoids were taken out. If a child who has large tonsils catches cold, the infectious process is likely to extend down into the throat and cause considerable swelling and irritation of the tonsils, which gives rise, in many instances, to a severe cough, and which undoubtedly incapacitates the child longer than would be the case if the tonsils had been removed. The frequent occurrence of colds with swelling of the tonsils and excessive cough may be, therefore, an indication for the removal of the tonsils. The tonsils may be removed in either the winter or summer. The season at which they are removed makes little difference. In general, unless there are very special indications, it is better to wait until the child is at least two years old before removing them.

INFLAMMATION OF THE EARS

Ear disease is very common in babies and young children. What is meant by ear disease is an acute inflammation in the cavity of the middle ear. The medical term for this condition is acute otitis media. The middle ear is a small cavity in the bone of the head situated at the internal end of the opening in the ear and connected with the inside of the nose by a small tube called the eustachian tube. The drum of the ear, which is a delicate, thin membrane, forms the external side of the middle ear cavity, and is seen by the doctor when he looks into the ear with his head mirror or electric light and ear

speculum. If there is any infection in the back part of the nose, such as would occur in an acute cold, this infection may extend through the tube joining the back part of the nose with the middle-ear cavity, and may give rise to inflammation there. When there is inflammation in the middle-ear cavity a considerable amount of watery fluid or of actual pus may be produced there. This causes pressure upon the ear drum and usually causes earache. Usually it is accompanied by fever, but in some cases, however, is not.

Symptoms of Otitis Media.—In little babies who cannot indicate where the pain is the only symptom of inflammation in the ear may be fever, crying, or restlessness. If a baby has had a cold and suddenly begins to scream, and keeps on screaming no matter what is done for it, the chances are that there is inflammation in the ear. On the other hand, in some instances, there may be apparently no pain at all, and the condition may give rise simply to fever. If an older child has ear trouble, there will almost always be earache, although here again it may be absent, and the first sign that any ear trouble has been present may be a discharge from the ear.

Treatment of Earache.—The doctor should always be called when a baby or young child has an earache. It is not necessary to call him in the middle of the night, however, unless the earache is very severe and the child is made very uncomfortable by it. A hot-water bottle should be applied, a dose of paregoric should be given, and the doctor should be called. When the doctor comes he may either lance the ear drum, thus allowing the fluid, which is present in the middle ear cavity, to escape and relieve the pressure there, or, if the inflammation does not appear to him to have proceeded very far, he may decide

not to lance the drum, in the hope that the condition will quiet down. Lancing of the ear drum will almost certainly relieve the pain. If the infection is a virulent one, it may not relieve the fever.

Treatment of the Ear After Lancing.—When the ear drum is lanced there follows the escape of a certain amount of serum, mucus, or pus. In some instances this discharge dries up in two or three days, but more often it persists for at least a week or ten days, and not infrequently may last for several weeks or even months. There are two ways of treating a discharging ear: (1) Dry wiping; (2) syringing. Either one of these methods may be ordered by the doctor in accordance with his personal preference and the condition of the ear. There are very few mothers who know how to take care of a discharging ear properly, and it may be helpful, therefore, to have detailed directions given.

1. *Dry Wiping.*—This is best done with a small pair of tweezers or forceps and little pledgets of cotton. The pledget of cotton is rolled between the thumb and forefinger, is then grasped in the tweezers, and inserted into the ear. It will go in more easily if the ear is drawn slightly back at the time of insertion. The ear is wiped with enough pledgets of cotton to make it thoroughly clean. The outside of the ear is then washed with warm water, carefully dried, and smeared with a little boric acid ointment. The purpose of the ointment is to prevent the irritating discharge from causing eczema of the external ear. Another way of dry wiping, if forceps are not available, is to wrap a piece of cotton about the end of a match or toothpick, and to use this as a swab. The trouble with most mothers is that they do not wipe the ear thoroughly; they are afraid of injuring it. There is practically no danger of doing this, unless too great

force is used or the match or toothpick is inserted more than $\frac{3}{4}$ inch.

2. *Syringing*.—This is the method used in the treatment of most discharging ears, and is more likely to be satisfactory in the hands of mothers than is dry wiping. A good many different solutions are used for syringing, but there is probably nothing any better than salt and water—1 teaspoonful of salt to 1 pint of water. A large size, soft-rubber ear syringe is used. The water should be at about 100° F. and at least 3 syringefuls should be used in each ear. The ear is gently drawn back in order to facilitate the entrance of the nozzle of the syringe. The nozzle is inserted $\frac{1}{4}$ inch and firm and gentle pressure is made on the bulb. A small basin should be held underneath the ear by an assistant, if possible, to catch the water as it returns. After the syringing the ear should be very carefully dried both inside and outside with pledgets of cotton. The drying after syringing is very important and is the part of the procedure that is usually most inefficiently done by mothers. After the canal of the ear has been dried, a small pledget of cotton is inserted with tweezers or forceps, and left there, and the outside of the ear is thickly smeared with boric acid ointment. A great deal depends upon the after-treatment of the disease. It will heal up very much more quickly, and there is much less chance of any serious results occurring, if the mother will take great pains with the syringing or wiping.

In the vast majority of cases there are no permanent bad results from acute ear disease. Children may have their ear drums lanced many, many times without becoming in the slightest degree deaf. On the other hand, there may be considerable destruction of the ear drum in some instances and the hearing may be impaired. This

is much more likely to happen when the ear has been allowed to open itself than when it has been lanced.

Mastoid Disease.—The mastoid process is that part of the skull which lies directly behind the ear. It is rather porous in character, and is made up of cells which communicate with the cavity of the middle ear. In certain cases of acute ear disease the inflammation may extend from the cavity of the middle ear and set up inflammation in the mastoid, under which conditions it becomes necessary to operate by cutting into the mastoid bone from the outside in order to let out the pus. The vast majority of cases of otitis media are not followed by mastoid disease, and when the large number of children who have ear abscesses and the few who develop mastoiditis is considered, it is evident that mastoid disease, while it may be occasionally an unavoidable complication, none the less occurs in only a small number of cases.

Prevention of Ear Diseases.—It is often supposed that disease of the middle ear is due to the child's ears getting cold. Inflammation of the ear does not come from the outside through the ear canal, but from the inside through the nose. The best preventive of ear disease, therefore, is to keep a child from taking cold and to treat it properly when it does take cold. If a child has had repeated attacks of ear disease or if it has a long-continued chronic discharge from the ear, the adenoids should be removed, as they constitute a source of irritation in the back part of the nose which predisposes to disease of the ears.

CROUP

What is known as "croup" is a catarrhal inflammation of the larynx with swelling of the mucous membrane which lines it. It is a fairly common condition, and some chil-

dren are subject to it each winter. Its onset is usually rather sudden and it is manifested by a sharp, dry, barking cough. In severe cases it may be difficult for the child to breathe, and there may also be a temporary high fever. While croup is a very alarming condition, it is not in most cases a dangerous one, and a great deal may be done for it by proper treatment. Some of the general principles of treatment, which it is well for every mother to know, are the following: (1) Wine of ipecac and syrup of ipecac give great relief in croup. If the attack is a very severe one and the child has much difficulty in breathing, it should be given a teaspoonful of wine of ipecac at once. This will soon cause vomiting and will relieve the breathing in a very striking manner. If the attack is not so severe as to need such heroic measures, the ipecac should be given, sometimes combined with paregoric, sometimes alone, in smaller doses every hour until the cough is loosened (see Medicines). (2) Warm, moist air in the room is of value. This may be obtained by having water boiling constantly in a small room. It helps to add compound tincture of benzoin to the water—1 teaspoonful to a quart. The windows should be kept shut at night when a child has the croup. (3) Hot applications to the throat, such as flaxseed poultices or hot-water compresses, may also be of value. A hot mustard bath is sometimes of service. The average attack of croup is likely to last three days, and is always worse at night. The child may have comparatively little hoarseness in the morning and during the middle part of the day, but late in the afternoon begins to become croupy. No matter how expert the mother may be in the treatment of croup, the doctor should always be called at once if a child has it, as in certain cases the croup may be caused by diphtheria of the larynx, which

is a very serious condition and which may need immediate skilled treatment.

BRONCHITIS AND PNEUMONIA

Bronchitis and pneumonia may develop from a previously existing cold or may come on suddenly without warning. What is known as bronchitis consists of an inflammation of the mucous membrane lining the bronchial tubes; the lung itself is not involved. Pneumonia is an inflammation of the lung tissue itself, and is of two forms, the so-called "bronchopneumonia," in which there are small, scattered patches of lung inflammation, and "lobar pneumonia," in which one, or possibly more, extensive areas in the lung are involved. Bronchopneumonia is more common in small babies, the lobar form in older children.

Bronchitis.—The chief symptoms of acute bronchitis are fever, a sharp, dry cough, and rapid breathing. In young babies the breathing may be so rapid and so difficult that the child gets blue. In older children, while the breathing is rapid, it does not distress them so much. There is likely to be a sense of constriction about the chest, soreness under the breastbone, pain on coughing. The temperature is usually not very high, in most cases being between 101° and 102° F. The especial things that it is desirable for a mother to know about the early stage of acute bronchitis are to recognize it when she sees it and to know what to do, before the doctor comes, to relieve the child. There are three things which help to relieve a child in the early stage of acute bronchitis: (1) a small dose of wine of ipecac, given every hour; (2) warm moist air in the room, just as for croup; (3) a flaxseed or mustard and flour poultice to the chest,

or sometimes, if this is not feasible, a hot bath. The doctor should always be called for acute bronchitis.

Pneumonia.—There is no drug which will cure pneumonia. The treatment consists in keeping the child as comfortable as possible and meeting special indications as they arise. It is vitally important to leave a baby or a child with pneumonia alone as much as possible. Many babies have been killed by being fussed over too much, handled too much, and overmedication. In the lobar form of pneumonia the patient usually will do better with the windows open, so that he can get plenty of cold, fresh air. In bronchopneumonia the cough may be made worse in some cases by this method of treatment. The two things for a mother to remember especially about pneumonia are that much medication and much handling of the child do more harm than good and that there is no specific cure for the disease. It must take its course and the child must fight it off itself. Pneumonia is, of course, always a serious disease, very much more so in babies than in older children. A baby with pneumonia must always be regarded as dangerously ill. A child from three to twelve years old is, of course, sick if it has pneumonia, but it has a much better chance of recovery than a baby. Indeed, the mortality from pneumonia is lower in early childhood than at any other period of life.

RHEUMATIC FEVER AND HEART DISEASE

Rheumatic fever is not an uncommon condition in children, and in a great many cases comes from infection in the tonsils. It is very rare, however, in babies. It is manifested by pain in the arms and legs, often accompanied by redness, and sometimes by slight swelling of the joints. The condition in the joints is not in itself

serious, but acute inflammation of the valves of the heart, the medical term for which is endocarditis, occurs so frequently with rheumatic fever that it is of the utmost importance to put a child to bed immediately if there is any swelling, tenderness or pain in the extremities, and to call the doctor at once. There is no such thing as "growing pains." Many cases of true rheumatism are neglected because many mothers and, unfortunately, some doctors also, believe that it is natural for children to have growing pains. A child may have, however, a muscular lameness after exertion, the same as an adult has, and it is also not uncommon for certain children to have pains in the shins at night after a very active day. These things, of course, have nothing to do with rheumatic fever. In many cases of rheumatic fever there is no inflammation of the heart, and the condition subsides in a few days or a week or two, leaving no permanent damage to the joints. In other cases there may be severe heart inflammation and the child may have to stay in bed for months on account of it. Unfortunately, inflammation of the heart is just as likely to occur when the manifestations of rheumatism are slight as when they are severe. The tonsils should be removed after practically every attack of rheumatic fever, as the infection probably started there originally, and as children who once have had an attack are very likely to have another, provided the tonsils have not been removed.

PYELITIS

Pyelitis is a rather common disease of the urinary tract which occurs most often in girls. It may occur at any age. In small babies it is manifested especially by high fever, which may last for some time. Loss of appetite and pallor are other common symptoms. In

older children the chief symptoms are fever, general malaise, loss of appetite and vigor, and sometimes, but not always, discomfort on urination and bed-wetting. The disease process in pyelitis consists of a mild inflammation of the pelvis of the kidneys, the ureters, and the bladder. The kidneys themselves are not involved. There are several different ways of treating pyelitis, and, in general, the treatment is satisfactory and the outlook for recovery good. It is a disease, however, which is especially likely to recur. If a child has once had pyelitis, a recurrence should be suspected whenever it is sick. Pyelitis should always be suspected when a baby or young child is feverish or sick without any apparent cause.

RICKETS

Rickets is a disease which occurs chiefly in bottle-fed babies between the sixth and the eighteenth months. Its chief manifestation is a faulty growth of bone, which may lead in severe cases to deformities, such as knock-knee and bow-legs. It is seen especially in the winter and spring, when babies get out of doors comparatively little. It is very common in its milder form, even among the children of the well-to-do, but the severe cases with deformity are seen especially in the children of the poor, who have not had proper food and general hygiene. The cause of rickets is in some dispute, but it seems certain that faulty diet and lack of sunshine are two of the most important factors in its causation.

It has been found that cod-liver oil or exposure to sunshine will prevent rickets, and also cure it after it has developed. It is, therefore, very important for all babies to be out of doors in the sun as much as possible, and mothers should bear this in mind, especially in the

winter, when sunlight is not so abundant as it is at other seasons of the year. The passage of sunlight through glass destroys its power to prevent and cure rickets.

SCURVY

Scurvy is a disease of nutrition which is not at all uncommon in young babies. It is caused by the lack in the diet of a substance called the antiscorbutic vitamin. This vitamin is contained especially in fresh milk, fruit juices, and vegetables. When milk is boiled or pasteurized, this is either destroyed entirely or rendered less efficient. There is no objection, however, to feeding a baby on pasteurized or boiled milk, provided orange juice is given also, as orange juice contains a large amount of the vitamin which compensates for the lack of it in the milk. It probably takes several months for scurvy to develop, so that, if a baby is to be fed on boiled milk for only a short time, it is not necessary to give orange juice, although, as a general thing, it is best to include orange juice in the diet of all babies after the sixth month.

The chief symptom of scurvy is tenderness, sometimes accompanied by swelling of the legs. There are so few other causes of tender legs in small babies that a mother can be fairly certain that her baby has scurvy if it cries with pain each time its legs are moved and its diapers changed. Sometimes the early symptoms are bloody urine or swollen, purple gums. The treatment is very satisfactory and consists simply in giving an ounce of orange juice a day to the baby. In the vast majority of cases this will cure the disease in a very few days. The juice of canned tomatoes is also efficient.

WORMS

Children are occasionally infected with worms. In New England such infection is by no means as common as is generally believed by the laity; in the Southern part of this country, it is much more common, and careful search for parasitic worms and their microscopic eggs should be made in the stools of all children, in that part of the country who are not doing well. The only reliable symptom of worms is the presence of worms or their eggs in the bowel movements. It is commonly believed that picking the nose and grinding the teeth at night are symptoms of worms. This belief is entirely without foundation. There are four kinds of worms which children in this country may have: (1) Pin-worms. This is the most common type. Pin-worms are very small, being from $\frac{1}{2}$ to 1 inch long and very slender. They look very much like pieces of white, linen thread. They may occur in large numbers in the lower part of the rectum, and may cause the child a great deal of discomfort on account of itching. They are usually passed in large numbers in the bowel movements. (2) Round-worms. A round-worm is from 2 to 4 inches long, of somewhat the same general shape and size as a common angle worm. If a child is infected with these worms, some of the worms are almost certain to be passed in the movements. (3) Tapeworms. The tapeworm is a very long, flat worm sometimes reaching a length of several feet. The diagnosis of tapeworm infection is made by finding portions of the worm in the bowel movements. These are flat and white in color and resemble very much small noodles. There are no characteristic symptoms of either round-worms or tapeworms. (4) Hook-worms. Hook-worm infection is very common in the Southern part

of this country, but does not occur in the Northern. The symptoms are those of general debility, usually combined with marked anemia. In this type of worm infection, the worms are not found in the bowel movements. There is a satisfactory treatment for all these worm infections, and, in most cases, the condition is not dangerous. The doctor should, however, always be consulted at once if the presence of worms is suspected.

WETTING THE BED

Bed-wetting is a very common and annoying condition. In the vast majority of cases there is no trouble with the kidneys or any part of the urinary tract, but the condition is due to the fact that the child has not learned how to control the nerve centers which govern urination, when asleep. The general condition of the child is often responsible for this. There have been innumerable drugs used in the treatment of bed-wetting, none of which are very efficient, and the best treatment is by a general course of training as outlined below.

A bed-wetter cannot be cured in a short time. It may take months of careful training, but, if the directions given below are carefully followed, the child is almost certain to improve.

1. Give as little liquid as possible after four o'clock in the afternoon. Extra liquid should be given in the early part of the day.

2. Be very careful about the child's diet, and follow to the letter the directions for diet given in the first part of this book. Be especially careful to allow no sweets, cocoa, or meat soups.

3. Be sure the child gets enough rest and that it leads simple life absolutely free from all nervous irritation.

4. Raise the foot of the bed about 8 inches from the floor by means of wooden blocks.

5. If the child lies on its back, before it goes to bed at night, tie a small towel about its waist with a large knot in the back.

6. Have the child repeat to itself out loud each night, twenty-five times, the following: "I will not wet the bed."

7. Have a calendar hung in a conspicuous place in the house; put a gold star on each day that the child does not wet the bed, a black star on each day that it does. If it gets as many as 4 gold stars in a week give a prize of some sort. A child should never be punished for wetting the bed.

8. Have the child pass water just before going to bed, and pick it up at ten or eleven o'clock, and again in the night, if anybody is awake. It is also advisable to have it pass water as soon as it wakes in the morning, as early morning is one of the most common times for a child to wet the bed.

9. It is also important to attempt to train the bladder. This may be done by having the child for one hour each day pass urine every fifteen minutes, and during another part of the day hold it as long as possible.

NIGHT TERRORS

It is not uncommon for a child to be afraid at night, especially if it is naturally of a nervous temperament. There are two types of these so-called night terrors. In one, the child wakes up suddenly from its sleep, screaming and greatly terrified. It says that there is something in the room, such as a bear, a lion, or a bad man, or that it can see something on the wall. In this type the child is often hysterical and, for a time, hardly seems in its right

mind. In such instances it will almost always be found that the child has been frightened by some definite thing or that some one has been telling or reading exciting stories about giants, witches, or wild animals to it.

In other instances the child wakes from a sound sleep, crying and apparently frightened, but not absolutely terrified. It is not afraid of any definite thing and cannot tell of anything that has frightened it. It is soon quieted and goes to sleep again without trouble. In such instances it will usually be found that the child has adenoids, which prevent it from breathing properly, or that it has had an indigestible supper.

The treatment is, of course, to remove the cause. Children should be guarded from things which will frighten them, and should not be told or read exciting or terrifying stories. Adenoids should be removed, if they are present, and the child should have a light, easily digestible supper. As children grow older, they gradually cease to have night terrors.

HERNIA

There are two kinds of hernia, or rupture, which babies and young children often have. These are: (1) umbilical hernia, where there is a protrusion of the navel; (2) inguinal hernia, where there is a soft bunch noticeable in the groin. The first of these two varieties is much the more common and occurs in many babies. The best treatment for umbilical hernia is to apply an adhesive plaster strap about 2 inches wide, and thus to keep the navel in position. This strap should be worn continuously until it comes off, and then another should be applied. Umbilical hernia is not a severe condition, and only very rarely needs operation.

Inguinal hernia is very rare in girls, but fairly common

in boys. It may appear in very young babies. The noticeable thing is a small, soft bunch in the groin. This bunch may vary from the size of a walnut to that of an egg. Sometimes it can be pushed back, sometimes not. Inguinal hernia is not, in most cases, a dangerous condition, but is much more serious than umbilical hernia. The best treatment for inguinal hernia in small babies is to apply a truss made out of a skein of yarn. This is usually much more efficient than a leather truss. When the yarn becomes dirty it can be washed, and a new skein applied. In a fair proportion of cases continuous wearing of this truss will cure the hernia after a few months. If the hernia is still present when the child is two years old, it should be operated on. The results from operation are almost uniformly good, if the operation is done by a competent surgeon.

CIRCUMCISION

Almost every boy baby has a tight foreskin, sometimes so tight that it cannot be pulled back over the end of the penis. If the foreskin is tight and cannot be retracted by the mother at the daily bath, the doctor should be called. He will probably be able to break up the adhesions and retract the foreskin, after which it should be pulled back every week and washed. If the adhesions are so tight that they cannot be broken up in this way, the child should be circumcised. If the foreskin is very long and becomes easily irritated and chafed, the child should likewise be circumcised. The operation of circumcision is not a dangerous one, but if it is to be done, a skilled surgeon should be picked out to do it, as a great many of the circumcision operations which are done are miserable botches and have to be repeated.

We emphatically do not believe in routine circumcision,

and believe that it should never be done unless there is a very definite indication for it.

BAD HABITS

SUCKING

The habit of sucking usually commences in infancy, at or about the period of dentition. Unless interfered with, it may continue until the children are six or seven years old. They most frequently suck the thumbs, fingers, or clothing. Sometimes they are given pacifiers and rubber nipples to suck.

When persisted in, sucking may produce arrested development of the face and bones of the skull, malocclusion of the teeth, and a misshapen mouth or fingers. It may cause disturbances of digestion and may lead to thrush or other forms of infection of the mouth. The habit should be stopped as soon as it is discovered. The habit is sometimes, but not often, due to hunger from an insufficient amount of food. If this is the cause, the sucking ceases as soon as the food is increased. The habit can be controlled, in most instances, by wearing mittens or fastening the hands to the sides during sleep. In obstinate cases it may be necessary to confine the elbow with cardboard splints to prevent the child from bending the arm so as to get the hand to the mouth.

NAIL BITING

Nail biting is seen most frequently in children over three years old. It is most common in children who are excessively nervous or whose general health is below par.

Every effort should be made to break up the habit at the beginning, and, in obstinate cases, cardboard splints should be used to prevent the child from bending the

arm at the elbow. The child should have plenty of rest and sleep and every means should be used to improve his general condition.

PSEUDOMASTURBATION

Any local irritation causing the child to rub the external genitals, or certain forms of play or exercise involving the rubbing of these parts, may produce a pleasurable sensation by mechanical excitation and the practice may develop into a habit. This is sometimes spoken of as masturbation, but is really pseudomasturbation and is no more serious than other bad habits. However, it should be corrected, as it may lead to masturbation in later childhood.

In some instances the genitals are rubbed with the hands or are rubbed against a pillow, piece of furniture, or some other foreign object. In infants it is most commonly accomplished by what is called "thigh friction." The child lies usually on its back with the thighs flexed, crossed, and pressed rigidly together. The movements are accompanied by evidences of pleasurable excitement, such as flushing of the face and an intent expression of the eyes. The rubbing lasts only a few minutes, and is succeeded by general relaxation, some perspiration, and an appearance of quiet contentment. The exact nature of this habit is often unsuspected by the child's mother for a long time. The attacks are noticed, but are only considered to be some "queer trick" without significance.

The treatment is to interrupt the habit. In young infants, a large diaper may be folded in such a way as to prevent approximation of the thighs. In obstinate cases it may be necessary to use a thigh spreader consisting of a bar with a cuff at either end. The cuffs are put around the thighs just above the knees. This spreader



FIG. 15.—CARDBOARD CUFFS OR SPLINTS.
(Courtesy of Jordan Marsh Co.)

keeps the thighs apart and prevents the habit. In children one should avoid giving the child the impression that the habit is essentially wicked or immoral, but should lay stress only on its physical aspect. One should direct one's influence toward strengthening the child's will and selfcontrol and should try to bring about such relations with the child that it will always gladly report each lapse.

It may be necessary to watch the child very closely and, as the child cannot be watched every minute of the day and night, it may be necessary to use some mechanical restraint to prevent the habit.

Chapter XXVII

EMERGENCIES

CONVULSIONS

THE nervous system of the baby and young child is much more delicately adjusted and unstable than that of the adult, and for this reason relatively slight causes may bring about convulsions in certain children. Most children never have convulsions, while others may have them from time to time, if the nervous system is irritated in any way. Convulsions may occur at the onset of any acute infectious disease or during a high fever, or may be due to overeating or indigestion. This last is perhaps the most common cause. It naturally terrifies a mother to see her child in a convulsion, but it is extremely uncommon for a child to die in a convulsion, no matter how severe it may be. When a child has a convulsion the doctor should, of course, be called immediately. There is much that can be done by the mother, however, before he arrives.

The baby should be immediately stripped and put into a tub of warm water. The temperature of the water should never be over 110° F. It is very important that the water should be tested either with a thermometer or the elbow of the mother, as in the excitement babies are not infrequently put into water which is so hot that it burns them. If mustard is handy, it is a good plan to put 1 or 2 tablespoonfuls of it into the bath. The purpose of the bath is to relieve the congestion of the brain

which is present by bringing the blood to the surface of the body. The child should be left in the bath about ten minutes, and should then be wrapped in a warm blanket and have a hot-water bottle put at the feet. It should then be given an enema. After the child is out of the convulsion, if the doctor has not come, a dose of castor oil should be given. That is, one of the most important principles in dealing with most convulsions is to empty the digestive tract as soon as possible. It is also a good plan to put a small piece of wood, such as a clothes-pin, between the jaws of the child so that it will not bite its tongue. In most instances the convulsion will be over before the doctor arrives.

BREATH HOLDING

Certain children, during hard crying, especially when they are angry, may hold the breath, sometimes long enough to produce unconsciousness. This is a rather terrifying but not dangerous habit, and is due simply to loss of control on the part of the child. The best treatment is to dash cold water in the face. This will usually cause the child to gasp and catch its breath again.

FALLS

Every baby falls out of bed or from its high chair occasionally. In the vast majority of cases this does no harm whatsoever, except to frighten the baby and its mother, and perhaps to cause a bump or bruise if the child lands on its head. After the fall the child will naturally cry for some time from fear and perhaps from pain. If it seems all right again, after half an hour or so, it is practically certain that no harm has been done. If it does not seem all right, and still cries or seems to be

in pain, the doctor should be called, as occasionally a bone may be broken or dislocated by a fall.

SWALLOWING FOREIGN BODIES

Children are likely to put all sorts of things into the mouth, and not infrequently swallow such things as marbles, coins, safety-pins and beans. The ordinary foreign body, such as a coin or a bean, does no harm and need cause no alarm. No treatment is necessary and it will almost certainly be passed in the stools within a day or so. If an open safety-pin is swallowed it may, on the other hand, do much harm, and the doctor should be called at once.

PUTTING OBJECTS INTO THE NOSE AND EARS

Children not infrequently put small objects into the nose and ears. If they do this, and if the object does not come out readily, the doctor should be called. What happens in most cases is that the mother, in trying to get the object out, merely succeeds in forcing it still further in. Sometimes an insect may fly into the ear, become caught there, and cause discomfort. The insect may be easily removed, however, by instilling a little warm sweet oil into the ear while the child is lying on the opposite side. If sweet oil is not at hand, water will usually do.

CUTS AND SCRATCHES

It is very important to pay attention to cuts and scratches, as sometimes an apparently insignificant pin prick may become infected and cause much trouble. The best treatment for a cut, scratch, or any slightly infected place on the skin is to wash it thoroughly with soap and water, dry, and then apply tincture of iodine.

After this clean gauze and a bandage should be applied. If the wound is deep and the whole of it cannot be easily exposed and cleaned, the doctor should be called.

POISONS

The mother should be extremely careful that no poisonous substances are left around where a baby or small child can get at them, as swallowing such things as lye, brass polish, and other harmful chemicals is a rather common occurrence. Lye is particularly dangerous, as it burns the lining of the esophagus and of the stomach. Another dangerous chemical is zinc stearate, which is often used as a powder for the baby's buttocks. A baby, while playing with the box, may spill some of the powder and inhale it through the nose and mouth. It is very irritating to the delicate lining of the bronchial tubes, and the inhalation of this chemical may, in some cases, be fatal. If stearate of zinc is used, the baby should never be given the box to play with.

If any poisonous substance has been swallowed, the first thing to do is to empty the stomach at once. The best way to bring on vomiting is to give $\frac{1}{4}$ teaspoonful of mustard in a glass of water. The child should then be encouraged to drink as much water as possible, which will probably soon be vomited and will help to wash out the stomach. The doctor should be called at once, as there are different antidotes for various kinds of poisons.

BURNS

If a burn is at all extensive or deep, the doctor should be called. If it is only superficial and over a small area, it may be treated by the mother. The best dressing for a slight burn is olive oil or vaselin.

DOG AND CAT BITES

If a child is bitten by a dog or cat, the mother should never attempt to treat it herself, but should call the doctor. The animal should not be killed, but should be turned over to a veterinary and kept under observation to see whether it develops hydrophobia or not.

Chapter XXVIII

MEDICAL SUPPLIES

THERE are a few medicines and medical supplies that almost every child will need sooner or later as it grows up. It is well to have in the house those marked with a star, which are simple remedies for some of the more common ailments of childhood.

LAXATIVES

The laxatives are drugs which are given to promote evacuation of the bowels. They are mild in action and are given occasionally to babies or children who have a tendency to constipation, or at the onset of an acute fever or cold. The following are the ones most useful for infants and young children:

***Milk of Magnesia.**—This is the most commonly used laxative for babies under two years of age. It is also used sometimes for older children. For most babies it is very satisfactory and works well. With certain babies it may, however, cause griping, in which case it should not be used. The dose for babies under a month old is $\frac{1}{2}$ teaspoonful; from then up to the end of the first year, 1 teaspoonful. It mixes well with milk and is usually best given in the nursing bottle with the last afternoon feeding. For children from two to five years old the usual dose is from 1 to 2 teaspoonfuls. Another good way to give it to children, especially if it is desired to secure a thorough cleaning out during the course of a digestive upset, is to give a teaspoonful every hour until five or six doses have been taken.

Compound Licorice Powder.—This may be given to children over two years old before going to bed at night. The dose is $\frac{1}{2}$ teaspoonful, given mixed with a little water.

Cascara Sagrada.—Cascara is a good laxative and is used in pill or tablet form, or as a liquid, the aromatic fluidextract. The dose, when in solid form, for a child of three years is from $\frac{1}{2}$ to 2 grains; in the form of the aromatic fluidextract, from 10 to 30 drops.

Phenolphthalein.—This is a widely used laxative and is ordinarily given to children in the form of flavored wafers ("phenolax tablets"). It is easily taken, works well, and is one of the most satisfactory laxatives for small children. The usual dose is 1 grain.

***Preparations of Senna.**—There are many proprietary laxative preparations of senna for children, the best of which are castoria, casafru, and syrup of figs. The usual dose of each is a teaspoonful. It should be increased or diminished, however, according to the need of the individual child. The active principle of all three is senna.

Our own preference in laxatives is milk of magnesia for babies, and one of the senna preparations or phenolphthalein for older children.

CATHARTICS OR PURGATIVES

Cathartics or purgatives are drugs which act more vigorously in emptying the bowels than do laxatives. They should never be used for habitual constipation, but are useful when it is desirable to empty the intestines quickly and completely, as at the onset of an acute digestive upset.

***Castor Oil.**—This is by far the best and most efficient cathartic. Its action is rapid and very thorough, and it does not ordinarily cause griping. It usually works

in from two to four hours, producing three or four watery stools, often containing a little mucus. Infants and children usually take castor oil very well, and it has not nearly so bad a taste as many people think. If a baby or child is refractory in taking castor oil or, indeed, any medicine, the best way to proceed is as follows: The child is tightly wrapped in a blanket, with the arms at the sides, and held upright. A warm spoon containing the castor oil is inserted far into the mouth and the back part of the tongue is pressed down with the front part of the spoon. Then the spoon is tilted upward and the oil runs down the throat. The usual difficulty is that the mother does not get the spoon far enough into the mouth, and as a consequence the oil is simply deposited in the front part of the mouth and is immediately spit out. If it is deposited far back in the mouth at the base of the tongue and the tongue pressed down, the child is more likely to swallow involuntarily and retain the oil. If it is spit out, another dose should be given at once. If it will not open its mouth, its nose should be pinched until it does. The dose of castor oil for babies under one year is 1 teaspoonful; for infants from one to two years, 2 teaspoonfuls, and for children from two to five years of age, 3 or 4 teaspoonfuls.

Calomel is a rather irritating purgative which is useful occasionally, but has by no means the general value that castor oil has. It is especially useful when the stomach is irritated and castor oil would not be retained. It is usually best given in divided doses in the form of small, easily friable pills or tablets, containing $\frac{1}{10}$ grain each. The dose for a baby of six months is $\frac{1}{10}$ grain pill every half-hour until ten are taken. Infants of a year take the same dose in the same way. Children of two to five years are given $\frac{1}{10}$ grain pill every half-hour until 15 have

been taken. It is always best to give a dose of milk of magnesia one-half hour after the last dose of calomel.

MEDICINES FOR COUGHS AND COLDS

***Nose Drops.**—One of the most common ailments that babies and children have is a cold in the head, and every mother should have in the house some preparation to drop into the nose if it is obstructed from accumulated secretion or by swelling of the mucous membrane during a cold. A good preparation for noses which are slightly obstructed is liquid albolene, from 2 to 5 drops of this being used in each nostril several times a day, according to the age. Albolene is not irritating and may be used every hour or two without doing any harm. Another good preparation which is of especial use during colds, when there is a large amount of secretion and considerable swelling of the mucous membrane, is the following: Iodin, $\frac{1}{4}$ grain; camphor, $\frac{1}{2}$ grain; menthol, $\frac{1}{2}$ grain; albolene 2 ounces. These drops should not be used more than three times in twenty-four hours, as they are somewhat irritating. In giving any nose drops a medicine-dropper with a blunt tip should be used. The child should lie flat on its back in order that the drops may have a chance to run well back into the nose and throat.

***Wine or Syrup of Ipecac.**—These two preparations are of the same strength and may be used interchangeably. They are used especially for croupy coughs in the early stages. They tend to loosen the cough and to promote the flow of mucus. They sometimes cause vomiting. They are best given in small, frequent doses with about a teaspoonful of water. Babies of six months may be given 3 drops every one or two hours; babies of a year, 6 drops; children of from two to five years, 8 to 10 drops.

In severe croup, where the child has great difficulty in breathing, and it is desirable to promote vomiting at once in order to relieve the spasm, a single dose of 1 teaspoonful should be given.

***Syrup of Hydioidic Acid.**—This preparation is used especially for bronchitis, but may be given for any condition in which there is considerable thick mucus present in the respiratory tract, which is difficult to raise. A baby of six months should be given 10 drops every three hours; a baby of one year, 20 drops; children of two years, $\frac{1}{2}$ teaspoonful; children of from two to five years, 1 teaspoonful. It is best given in about 2 tablespoonfuls of milk or water.

MISCELLANEOUS

***Sweet Spirits of Niter.**—This is given at the onset of acute fevers to make the child more comfortable. It is relaxing in its effect, promotes sweating, and probably reduces the temperature a little. It is given well diluted with water, and sometimes with the addition of sugar, every hour for four or five doses. The dose for a baby of six months is 5 drops; for a baby of a year, 10 drops; for children of from two to five years, 20 drops.

***Paregoric** is a most useful drug in its proper place, but is often used improperly. It is a depressing drug if given too frequently or in too large doses. Its action is quieting and it is often of the utmost value to babies or children who are restless from fever or from pain. It is also occasionally valuable to stop an irritating cough. The usual dose is as follows:

Six months.....	6 drops
One year.....	12 “
Two years.....	20 “
Three years.....	30 “
Five years.....	40 “

It is best given with a teaspoonful of water. Paregoric is a drug which should ordinarily not be given as a routine every two, three, or four hours, as most other drugs are. A dose of it should be given, then if the desired effect does not take place, another dose should be given in an hour.

CARE IN GIVING MEDICINES

It goes without saying that in giving any medicine the mother should always be very careful to get the exact dose that the doctor ordered and to give it at the exact intervals which he ordered. However, a moderate overdose of any of the drugs described above, with the exception of paregoric, would do no harm, and they are, therefore, safe drugs for use at any time.

MEDICAL SUPPLIES

Following is a list of medical supplies which every mother should have in the house:

1. A clinical thermometer, rectal for children under four years of age, mouth for older children.
2. A 2-quart douche bag to be used in giving enemas.
3. A small, soft-rubber ear syringe to be used in giving enemas to small babies.
4. Absorbent cotton.
5. One package of sterile gauze to be used for dressing cuts and bruises.
6. Several rolls of bandage 1 or 2 inches wide.
7. A small roll of adhesive plaster $\frac{1}{2}$ inch wide.
8. Boric acid crystals.
9. Tincture of iodine, to be used in touching up small cuts and infected mosquito bites.
10. Boric acid ointment, to be used in dressing cuts and bruises.

BABY'S WEIGHT RECORD

WEIGHT OF BABY..... LBS. OZS. AT BIRTH DATE.....

DATE	AGE IN WEEKS	LBS. OZS.	DATE	AGE IN WEEKS	LBS. OZS.	DATE	AGE IN WEEKS	LBS. OZS.	DATE	AGE IN WEEKS	LBS. OZS.	DATE	AGE IN WEEKS	LBS. OZS.
	1			14			27			40				
	2			15			28			41				
	3			16			29			42				
	4			17			30			43				
	5			18			31			44				
	6			19			32			45				
	7			20			33			46				
	8			21			34			47				
	9			22			35			48				
	10			23			36			49				
	11			24			37			50				
	12			25			38			51				
	13			26			39			52				

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	3			16			29			42	
	4			17			30			43	
	5			18			31			44	
	6			19			32			45	
	7			20			33			46	
	8			21			34			47	
	9			22			35			48	
	10			23			36			49	
	11			24			37			50	
	12			25			38			51	
	13			26			39			52	

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	4			17			30			43	
	5			18			31			44	
	6			19			32			45	
	7			20			33			46	
	8			21			34			47	
	9			22			35			48	
	10			23			36			49	
	11			24			37			50	
	12			25			38			51	
	13			26			39			52	

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